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VOL. XLVIII No. 3 — MARCH 1933

The American City

ISSUED MONTHLY BY THE
American City Magazine Corporation
470 Fourth Ave., New York

EDGAR J. BUTTENHEIM, Pres. and Mgr.
HAROLD S. BUTTENHEIM, Editor
THEODORE R. KENDALL
Secretary and Engineering Editor
H. M. OLMSTED — M. V. FULLER
ANNA H. CLARK
Associate Editors
HERBERT K. SAXE
Treasurer
PRENTICE C. FORD, Asst. to President — MYRON MacLEOD, Advertising Manager

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BRANCH OFFICES
Daily News Building, Chicago
TOM DIX, Vice-President
642 Hanna Building, Cleveland
GEORGE S. CONOVER, Manager
402 Monadnock Bldg., San Francisco
DUNCAN A. SCOTT, Representative

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Subscription, $2 per annum
($3 to Canada and foreign countries)
Single copies, 35c
Back numbers available

Entered as second-class matter, July 29, 1910, at the Post Office at New York, N. Y., under Act of March 3, 1879. Printed in U. S. A.

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In THE MUNICIPAL INDEX (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find much material, including lists, and articles on a wide variety of municipal and civic subjects, not published in the monthly issues of the magazine.

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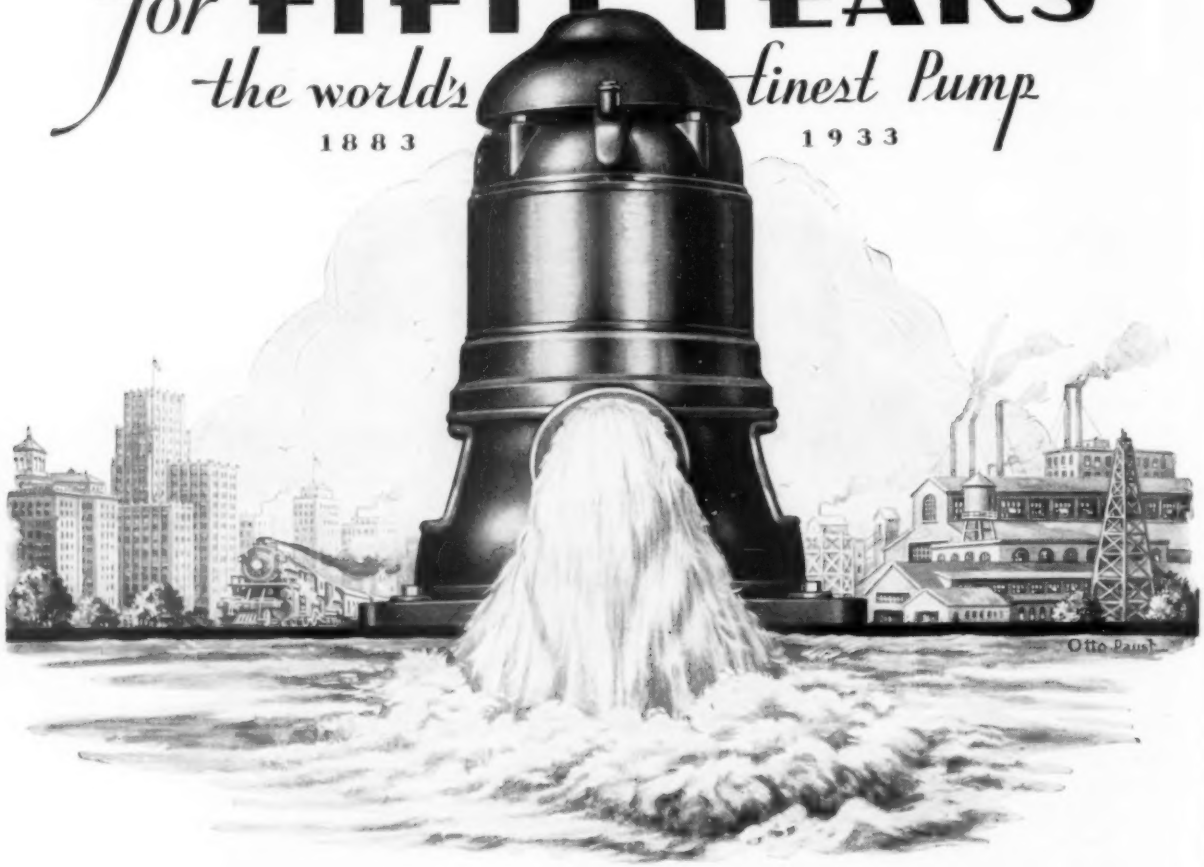

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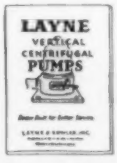

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Spending and Building vs. Depression

R.F.C. Loans for Self-Liquidating Projects in February

THE following loans for self-liquidating public works were approved by the Reconstruction Finance Corporation in February:

Brookneal, Va., new water supply and distribution system	$ 27,500
Reynolds Irrigation District, Melba, Idaho, purchase of springs and construction of an open ditch and necessary piping	60,000
Dufur, Wasco County, Ore., extension and replacement of parts of city's water-supply line	10,000
Chance Marine Construction Co., Annapolis, Md., completion of construction of docks and a breakwater in Annapolis harbor	59,850
Los Angeles, Calif., transmission line from Boulder Canyon to Los Angeles	22,800,000
Kansas City, Mo., toll bridge across the Missouri River	600,000

Only $18,497,000 in cash had been paid out by the Reconstruction Finance Corporation to aid in financing construction of self-liquidating projects up to the close of business on February 15, according to the Corporation's most recent review statement.

"Unemployment Relief Funds By All Means Should Be Spent for Necessary Public Works of Permanent Character"

THIS is a definite statement in the report on "Unemployment Relief Funds for Public Works," prepared by Engineering Societies of Boston, assisted by Emergency Planning and Research Bureau, Inc.* Methods of handling unemployment relief activities (work, paid for in money, done by a person who has become practically destitute from lack of employment) have been examined in detail for nearly forty of the typical and larger municipalities of the Boston Metropolitan Area, to ascertain the procedures best adapted for cities and towns; and also to show the results actually accomplished in using the unemployed to create public improvements of lasting value. The report says:

"It is highly important that the work undertaken shall be a needed improvement of permanent nature. Normal maintenance work should not be slighted at times of business depression; neither should it be classed as unemployment relief work.

"The various kinds of work projects reported include sewers, drainage, water works, highways, public buildings, cemeteries, parks and playgrounds, including public golf courses, forestry, moth work, mosquito control, tree cutting, work for the local fire department and electric department, city cleaning, clerical work and private job finding.

"Construction of public works will involve a greater expenditure to accomplish a given amount of relief than will welfare distributions, because of the necessary expense for materials and overhead charges. On the other hand, the advantage to the community of combining unemployment relief with something in the way of public betterment is obvious if the additional funds can be secured on any reasonable basis. Of scarcely less value than the material benefits is the maintenance of morale and self-respect in the community through the opportunity afforded the unemployed to render service and help themselves."

* Published in 1933. 18 pp. $1.00. Apply to Engineering Societies of Boston, Tremont Temple, Boston, Mass.

"For the Things the Country Ought to Have, It Can Well Afford to Pay"

"IF there is one thing in which the citizens of all parts of the country have an interest, it is in the decent education of the citizens of all parts of the country," says President Robert M. Hutchins of the University of Chicago, writing in *The Rotarian* for February. He states that the people themselves must "believe that tax-supported education and research are important and must themselves determine to protect them." Continuing, Dr. Hutchins says:

"Although I favor reducing the cost of government if it can be done without crippling essential services, I doubt whether in the long run the *total* cost of government can be reduced, or should be reduced, or will be reduced; but certain costs of government could and should be reduced. The total cost of government could and should be redistributed, with certain items increased, and other items eliminated. . . .

"'Reduce the cost of government' is likely to degenerate into a slogan like those two meaningless war-cries, 'Balance the budget,' and 'Take the Government out of Business.' The budget is not balanced, and we should be sorry if it were. The Government should know when it can balance its budget; it should know how it can do it. But there is no mystic charm about any particular twelve months. The attempt to balance the budget in the current fiscal year would lead either to back-breaking taxes or the elimination of governmental services which even certain critical newspapers would regard as essential. The budget has been unbalanced not less than forty-eight times in our history.

"In a business civilization, the government cannot be taken out of business. If it could be, business itself would be the first to want it back. Those who want it taken out of business usually mean that they wish to derive every advantage from natural or legal monopoly or from governmental subsidy and protection without submitting to governmental regulation in the interest of the general public. If we reduce the cost of government, we must be sure that we are not sacrificing those interests and institutions which alone make our government possible."

"A Tax May Be High Yet Not Wasteful"

IN discussing "Locating Removable Causes of Tax Waste and Too High Taxes," the Institute for Public Service (Wm. H. Allen, Director, 53 Chambers Street, New York) states, among others, the following methods that have succeeded:

"*Recognizing that some taxes pay big dividends* works better than talking as if all taxes were burdens. The fact that taxes increased faster than population raises helpful questions, but doesn't prove waste or inability to spend.

"*Recognizing that it is hard to cut expenses* is fairer than calling it easy. It is not easy to know just where to cut, and it is hard to face the many-sided and persistent opposition to any important cut.

"*Specific tax facts strengthen tax protests.* Personalities, invectives and threats soon leave officials cold, bore audiences, bolster tax waste.

"*Demanding no benefit for taxpayers that is not best for the public* works better than demanding tax cuts for property owners 'no matter how or where.'

"*Locating under-assessed properties is a short cut to relieving over-assessed properties.* Recipients of tax favors seldom work against tax waste.

"*Making news for newspapers to report* pays better than begging newspapers to use appeals or protests that of themselves are not news."

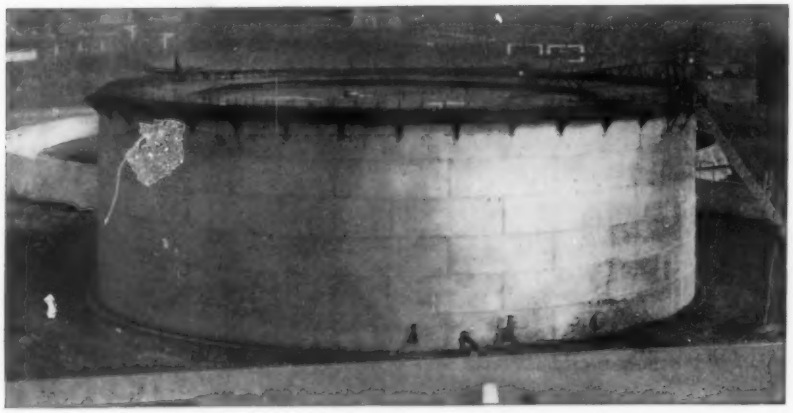
The Revivifying Effects of Executing Great Projects

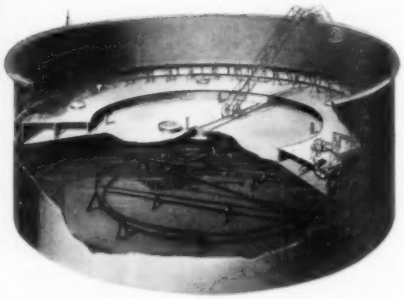
SPEAKING before the Industrial Rehabilitation Committee of the Chamber of Commerce of Los Angeles, on February 3, Charles F. Abbott, Executive Director of the American Institute of Steel Construction, said:

"It is a pitiful sight to see thousands of men in our great cities standing around waiting for a chance blizzard to get an engagement for a few hours cleaning away the snow when they might just as well have been employed building the Tri-Borough Bridge in New York, the Golden Gate Bridge at San Francisco, or the Trans-Mississippi Bridge at New Orleans, . . . definite additions to our national wealth.

"The construction industry, aggregating $7,000,000,000 to $5 00,000,000 per year, . . . represents the transformation of our savings into consuming power, it employs millions of men and women, uses the products of thousands of mills and factories, provides thousands of car loadings to our railroads, absorbs millions of horsepower produced by our utilities."

Underwriters' Laboratories Approve WIGGINS FLOATING ROOFS





Above: 37,500-bbl. gasoline tank at Chelsea, Mass., equipped with a Wiggins Floating Roof. Right: Cut-away view showing the construction details of a Wiggins Floating Roof.

UNDERWRITERS' Laboratories recently approved the Wiggins Floating Roof as a fire protection device and now include it in the list of Inspected Appliances maintained by that organization.

The Wiggins Floating Roof, which is used extensively on tanks storing gasoline and other inflammable liquids, rides directly on the surface of the liquid in a tank and completely blankets it. Air cannot come in contact with the contents of the tank, consequently they cannot be ignited. There is no space between the roof and the liquid for vapor to collect and form a hazard.

The Underwriters' Laboratories are maintained by the National Board of Fire Underwriters for the purpose of inspecting fire preventive equipment and materials. Inasmuch as this experienced organization has placed its approval on the Wiggins Floating Roof, municipal officials can specify its use and fire authorities can permit the installation of tanks so equipped with confidence that no serious fire hazard is being introduced.

The complete report of the Underwriters' investigation has been issued in booklet form. Copies may be obtained free of charge direct from the Underwriters' Laboratories or from our nearest office.

History of the WIGGINS FLOATING ROOF

The Wiggins Floating Roof was introduced in 1922. Since that time, it has been used extensively by oil companies to prevent evaporation and fire. Approximately 2500 installations have been made under widely varying conditions in all parts of the world.

The same principles which enable the Wiggins Floating Roof to reduce fire hazard also practically eliminate evaporation loss. These evaporation savings usually repay the cost of the roof in a short time. After that the savings are net gain and the fire protection is without cost.

Construction Features

The Wiggins Floating Roof consists of a deck which is about 16 inches less in diameter than the tank and a seal which closes the space (8 inches all around) between the deck and the tank shell.

The deck is constructed of heavy steel plates with either welded or riveted joints. The bottom of the deck is protected from corrosion by the contents of the tank and the top is open to inspection and painting.

The seal consists of a series of vertical shoes supported from the deck in such a manner that they form a long sliding contact with the tank shell at all times. Fire-resisting flexible material extends from the tops of the shoes to the deck, enclosing the space within the seal.

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B-335

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Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Operating Costs Reduced in Litchfield, Ill.

SIX years ago a 200,000-gallon elevated tank was installed in the water-works system at Litchfield, Ill., and it has maintained a uniform pressure in the distribution system ever since. A city may outgrow the capacity of its tank and need additional ones, or its water needs may change so that additional mains are required, but an elevated tank will always deliver its capacity at a definite minimum pressure.

Litchfield is a city of about 6,700 people and covers an area of 4 square miles. The water works is operated by the Citizens Water Works, Inc. Three electrically driven pumps draw water from a 300,000,000-gallon reservoir and pump it into the system. The Chicago Bridge & Iron Works tank, which is located near the center of the city, rides on the system, maintaining a uniform pressure.

The distribution system consists of 27 miles of 4-, 6- and 10-inch mains. There are 167 hydrants for fire service. The average daily consumption per capita is about 100 gallons, and there are 1,250 customers, 27 of which are industrial. The following table gives rates and costs for the past six years.

Year	*Cost of Operation (Cents per 1,000 Gallons)*	*Average Yearly Pumpage (Million Gals. per 24 Hours)*
1926	6.0	0.93
1927	5.4	0.81
1928	5.0	0.77
1929	4.8	0.81
1930	5.0	0.85
1931	5.7	0.72

The operating costs of 5.7 cents per 1,000 gallons in 1931 is slightly higher than the trend for the previous years. This increase was due to low-lift pumpage. A considerable amount of water was pumped from the river in 1931 owing to drought and depletion of the supply in the reservoir. If the low-lift pumpage is not figured in, the cost would be 5.4 cents.

A. G. KLEMBECK, JR.,
Secretary, Citizens Water Works, Inc.

The St. Paul, Minn., Water Supply

AUGUST 10, 1932, concluded the fiftieth year of operation of the St. Paul Water Department as a publicly owned utility. From the original company having a valuation of approximately $530,000 in 1869 and employing but a handful of men, owning but a few miles of mains and serving approximately 1,930 customers, the Department has prospered and grown until today it has a valuation conservatively placed at $24,000,000; its distribution system consists of nearly 600 miles of water mains; it serves nearly 275,000 people and has 230 employees.

The city's water supply is obtained through a series of large and small lakes extending north from the city limits for twenty miles. These lakes are divided into two systems, namely, Centerville Lake and Vadnais Lake systems. The lower or Vadnais Lake system is the principal system in the chain and is maintained at proper elevation by water from the upper lakes or by water from the Mississippi River. The Centerville system, consisting of four principal lakes, with a watershed of 81 square miles and a water surface of 2,200 acres, may be pumped into the Vadnais system through conduit and canal. This system is now held in reserve. The Vadnais system consists of five principal lakes, with a watershed of 27 square miles and a water surface of 1,500 acres. Water from Bald Eagle Lake can in emergency be supplied to this system, through Otter Lake. Water from the Mississippi River enters the system through Charles Lake, to Pleasant, to Vadnais. Supply to this system from the river is almost continuous throughout the year.

There are three sets of driven wells, the system of Centerville consisting of 28 wells, 18 shallow and 10 deep, averaging 390 feet in depth. The available capacity of the 28 wells is from 7,000,000 to 10,000,000 gallons a day. At Vadnais Lake are ten wells—seven shallow, and three over 600 feet deep. These wells will produce approximately 3,000,000 gallons a day. At McCarron are six 12-inch wells, one 1,000 feet deep and five 700 feet deep. The available capacity is about 6,000,000 gallons a day.

The main pumping station is at McCarron Lake. It is built under the same roof with the filtration plant, and obtains its water from the clear wells. This station contains three Allis-Chalmers horizontal cross-compound steam pumps. The first pump, working against a 75-foot head, delivers water to the 16-million-gallon low-service reservoir; the second, working against a 175-foot head, delivers water to the 30-million-gallon Dale Street reservoir; and the third, working against a 200-foot head, delivers water into the Snelling reservoir area. An 18-million-gallon reservoir in this system acts as an equalizer. Held in reserve at this station, but in a separate building, are one 10-million-gallon, one 6-million-gallon, and one 3-million-gallon vertical steam pump, and two electric centrifugal pumps of 7½ million gallons capacity each. On the south side of the Mississippi River, or in what is generally termed the West Side,, a steam pumping engine takes its supply from the low-service system and elevates the water into two steel standpipes of 100,000 and 200,000 gallons capacities.

The Hazel Park electric station raises water from the mains of the Dale system into the 500,000-gallon Hazel Park reservoir; the Hayden Heights electric station boosts from the Hazel Park system into the extreme heights of Hayden Park; the St. Anthony Park north electric station takes water from the Snelling service and boosts into one 200,000-gallon steel tank; and the water for the highest points of Highland Park is pumped from the Snelling reservoir into the 200,000-gallon Highland Park tower

LEONARD N. THOMPSON,
General Superintendent and Engineer, Board of Water Commissioners, St. Paul, Minn.

Service Pipe Campaign Aids Unemployed

RECENTLY the Water Department of Glen Ridge, N. J., mailed to the citizens with the quarterly bills a bulletin which announced a reduction in the charge for replacement of service lines, advising the citizens to take advantage of present conditions in replacing old corroded house connections with new pipe. The bulletin reads:

"The water pressure in the borough is very good, and if the pipe lines from the main to the faucet in any house are of proper size and in good condition, there should be ample water available at a good pressure. If you are having difficulty in getting a good supply of water through your house, your plumber should be able to tell you whether the trouble is in the house plumbing or in the lines from the house to the street. If you prefer, the Water Department will make a test at the meter to see if the trouble is in the house or outside.

"If the trouble should be located in the pipes outside the house—due to corrosion—and you should desire to have them replaced, the Water Department upon request will make a survey and give you an estimate of the cost. The borough ordinance under which the Department operates makes it mandatory that this work be done by the Department and payment made in advance.

"Due to the present low price of material—copper, etc.—the Department is able at this time to reduce the former cost of replacing the service pipes by approximately 20 per cent to 25 per cent.

"The necessary excavating on a job of this kind can be done by our unemployed, who would welcome the opportunity to work.

"If you have any problems in connection with the water supply, do not hesitate to communicate with the office of the Water Department, and we will be glad to go over them with you."

A. F. ESCHENFELDER,
Superintendent, Glen Ridge, N. J., Water Department.

BALANCED DESIGN!

The "Plus" quality in American and Niagara Water Meters

Each part in a water meter must be well designed, finely built, if the meter is to give reasonable service. But an aggregation of fine parts is not enough to assure truly fine performance. It requires something "plus." *Balanced design* is essential!

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Back of every American or Niagara Water Meter you buy today is 40 years' steady development of perfection in each part and in the balance of the whole. You can test for yourself the superior performance of American or Niagara Meters on your next meter order. Write for prices and details.

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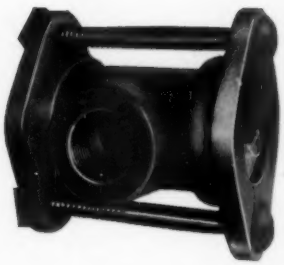

A most efficient expansion joint for connecting service lines and now available equipped with lead-tipped gaskets for manufactured gas line service. Easily and rapidly applied, yet permanently tight and leak-proof. Boss in side-opening type may be tapped for any size opening required.

Sizes from ½ to 2 inches

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Water Meters Aid Revenue

Items on Advantages of Meters

Phoenix, Ariz.

THE population served by the Municipal Water Department in Phoenix in 1920 was 35,000. This population was 22 per cent metered and the average daily consumption was 165 gallons per capita. In 1930 each figure increased—population to 55,000, per cent metered to 35, and daily consumption to 210 gallons per capita. The population increased to 58,000 in 1932, the per cent metered to 44, and the per capita consumption remained at 210 gallons.—C. E. GRIGGS, City Engineer.

Fayetteville, Ark.

IN 1900 the population of Fayetteville was 4,500. There were no meters in the system, and the average daily consumption was 60 gallons per capita. In 1910, still with no meters and a population of 5,000, the consumption had increased to 100 gallons per capita. In 1920 the population rose to 8,500, and 50 per cent of the domestic services were metered, bringing the daily consumption to 90 gallons per capita. In 1930 the population had increased to 10,000, the system became 100 per cent metered, both domestic and industrial, and the average consumption decreased again to 70 gallons per capita daily. With the same population and meter figures the consumption had decreased to 65 gallons per capita in 1932. When the plant was fully metered, the revenue increased practically 50 per cent. This figure is an estimate, since the meters were installed gradually from 1925 through 1927 and there is no accurate check on the total. The information, however, is based on the average collection per customer.—E. M. RATLIFF, Superintendent, Water Department.

Jonesboro, Ark.

IN 1900, when the population of Jonesboro was 5,000, there were no meters in the system. Metering started in 1920, and in 1924, when the population was 9,000, 50 per cent of both the domestic and industrial services were metered and the average daily consumption was 111 gallons per capita. In 1932 the population had risen to 11,000; all services are metered and the daily consumption has dropped to 69 gallons per capita. In 1924 the pumpage was 350,000,000 gallons and the average revenue per million gallons was 8.97 cents, with 1,211 flat services and 1,326 meters. In 1931 the pumpage had been reduced to 279,000,000 gallons, the revenue had increased to 20.5 cents per thousand gallons, with 2,940 services all metered.

With the income of $31,000 in 1924 increased to $53,000 in 1931, there is no doubt that metering pays, not only in dollars, but in the saving of capital expenditures necessary to lay new feeder mains, drive new wells, increase the storage capacity, etc., all to feed flat service waste. The annual meter repair cost in Jonesboro is less than 1/20 of the revenue increase of 1931 over 1924. The cost of all the installations could have been paid out in last year's revenue increase over 1924. The distribution system is ample for an annual pumpage equal to that of 1924, which under present conditions seems to be well in the future.—LLOYD M. ROBSAMEN, Manager, City Water and Light Plant.

Burlingame, Calif.

NO records are available for calculating metering and consumption in Burlingame prior to 1926, at which date the distribution system was 100 per cent metered. In 1929 the population was 13,500 and the per capita consumption 85.7 gallons; in 1930, population 13,600, per capita consumption 88.4 gallons; in 1931, population 13,600, per capita consumption 91.9 gallons. The increase in consumption was due entirely to a greater pride in lawns, which resulted in an increasing use of water.—H. W. SCHUCK, Superintendent, Water Department.

San Francisco, Calif.

IN 1900, when the population of San Francisco was 343,000, none of the domestic services were metered, but 19 per cent of the industrial services were metered and the average daily consumption was 74.2 gallons per capita. In 1910 the population had increased to 416,912, the industrial metering to 24 per cent, and the per capita consumption to 85.4 gallons. In 1920, with the population 508,410 and all domestic and industrial services metered, the daily consumption dropped to 71.1 gallons per capita. In 1930 the population was 637,212, the services 100 per cent metered, and the consumption 76.7 gallons per capita. The population increased to 662,970 in 1932, the system is still 100 per cent metered, and the daily consumption has dropped to 74.4 gallons per capita.—V. E. PERRY, Manager, Water Sales Division, Water Department.

Southington, Conn.

AS there was no main-line meter installed in Southington prior to 1922, the consumption was not definitely known until that time. In 1910, when the population was 4,200, 1.5 per cent of the domestic services were metered and 30 per cent of the industrial services. In 1920 the population supplied was 6,700, and 10 per cent of the domestic services and 100 per cent of the industrial services were metered. In 1923 the first figures were available on per capita consumption, which was 95 gallons daily. In 1930 the population supplied increased to 8,600, the domestic meters to 18 per cent, industrial meters to 100 per cent, and the average daily consumption was 93 gallons per capita. In 1932 the population supplied was 8,700, domestic meters had increased to 20 per cent, industrial meters were still 100 per cent, and the per capita consumption had dropped to 80 gallons daily. At least 6 gallons of the reduction over 1930 consumption is accounted for by a materially reduced factory consumption, so that there was an actual per capita reduction in consumption of about 7 gallons. Domestic meters are installed only as requested by property owners, and since most of the requests have come from the smaller users, the Water Department has been the loser in income by about one-third the amount of the schedule rate on the domestic services metered. The reason for installing domestic meters as we do is to get started towards a metered system and to give the smaller user a fair deal. I believe that when establishing meter rates each company or department should make its meter rent, service charge or minimum rate high enough to cover the cost of maintaining the meters. Our cost for maintenance of a ⅝-inch meter, including interest, depreciation and meter reader expense, is about $2.75 a year. Under the present practice there has been a small per capita reduction in consumption, so it is evident that if we were 100 per cent metered, a very material reduction in consumption would be brought about.—S. H. MACKENZIE, Superintendent, Water Works Department.

Jacksonville, Fla.

THERE is no record of the metering or daily consumption per capita in Jacksonville, Fla., prior to 1920, when the system was 95 per cent metered for domestic services and 100 per cent metered on industrial services with the exception of sprinkler systems. At that time the average daily per capita consumption was 69.75 gallons. In 1930, when the population had increased from 91,558 to 129,549, the system was 98 per cent metered on domestic services and 100 per cent metered on industrial services except the sprinkler systems, and the per capita daily consumption had increased to 85.74 gallons.—O. Z. TYLER, Superintendent, Electric Plants and Water Department.

This is the second monthly page of information on water metering and its savings.

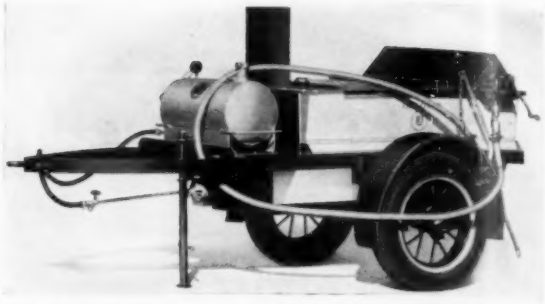
Don't let worn-out Equipment cut into your highway funds!

Worn-out equipment costs money. Every time there is a break-down, the result is delay—and delay means money. That's when new equipment helps you keep within your appropriation.

Tar kettles don't last forever; neither do tool boxes, paving tools or other maintenance outfits. Replacement must be made; but, there is no need to make a large outlay for new equipment. Take care of the good equipment you have and replace the worn-out pieces that cost you money to operate.

Your streets must be properly maintained—you know that nothing reflects the character of a city or town more than the condition of its streets. Keep your highway department operating on an efficient basis; re-equip with new Littleford outfits purchased at the lowest prices in the history of Littleford Bros.

It will soon be time to start spring maintenance. Look over your equipment now. Then write for a copy of our Road Equipment Catalog and select the outfits you need.



The Littleford No. 84-HD Tar and Asphalt Kettle, when equipped with our hand spray attachment, makes a complete low-priced maintenance unit ideal for penetration patch work.

There is no finer maintenance outfit made for the handling of emulsions than the Littleford No. 93-AM Sprayer. It has a 70 gallon air-tight tank and operates under 40 lbs. pressure.

Use our No. 98 Surface Heater to remove the "fatty" surface from slippery bituminous macadam streets. It is also used to remove bumps from asphalt streets—it softens the asphalt so that bumps can be easily raked and smoothed out.

Stop loss and theft of tools by keeping them in the Littleford HanDeeBox. It is made entirely of steel. One lock securely fastens both covers. There are no padlocks. The City of Cincinnati uses a fleet of twenty-two HanDeeBoxes.

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Road Maintenance Equipment
SINCE 1900
LITTLEFORD BROS., 500 E. PEARL STREET
CINCINNATI, OHIO

Construction and Maintenance

Engineering and Highway Departments

The Municipal Hot-Mix Asphalt Plant, Sydney, Australia

IN the Annual Report of the City Engineering and Building Surveyors Department of the city of Sydney, Australia, mention is made of certain improvements which have been made within the last year in the hot-mix asphalt plant. Two new 600-gallon bitumen kettles and a 2-ton road roller have been added to the equipment, and also a special pyrometer. This unit for the hot-mix asphalt plant is an automatic thermo-electric controller having a temperature range of 0 to 750 degrees Fahrenheit. By means of this instrument it is possible to control the supply of oil to the burners and thus regulate the heating of the materials, the instrument being, as indicated, automatic in operation. The effect has been to reduce, to a minimum, the variations in temperature of successive batches of asphalt materials, and, consequently, the quantity of material rejected because of wrong temperatures.

Temperatures observed since the controller was installed show a batch variation of + or — 10 degrees Fahrenheit, whereas previously variations of from 50 to 100 degrees were possible. The advantages obtained by the use of the instrument are: increased output; reduced delays at the roadway; a saving in fuel oil; elimination of double handling of materials; improvement of the asphalt mixture as to uniformity; and less liability to corrugation of the road surface.

In addition to the installation of the first pyrometer, a second with a reading of from 0 to 500 degrees Fahrenheit and with an independent six-point switch was installed at the bitumen and tar heating stationary plant. With this instrument the temperature of the bitumen or tar in any tank can be obtained at any moment. Previously, difficulty had been experienced in keeping proper temperature control of the material.

The creation of a dust nuisance in connection with the operation of the hot-mix asphalt plant necessitated measures to abate the nuisance. After investigation, a tender was accepted for the installation of a Davidson type dust collector. This plant collects the dust arising from the top and bottom of the bins, and also from the hot-mix plant, and since its installation there have been no complaints from adjoining residents.

A feature of the installation is the amount of dust collected by this unit and its value. The dust is used as a filler for sheet asphalt sidewalk construction and is worth 40 shillings per ton; 67.53 per cent of the dust passes a 200 mesh sieve and 18.72 per cent is retained on a 200 mesh sieve.

A feature of the 1931 operation of the hot-mix asphalt plant was the conversion of old roadways into modern, long-life, smooth-surfaced roadways at remarkably low cost, by placing an asphalt surface on the old road foundation. Old water-bound and penetrated macadam roads lend themselves particularly to this treatment, for it is generally found with this type that only the wearing surface has disintegrated, the base being in good condition and thoroughly consolidated by years of traffic.

The old surface is scarified to a depth of 2 inches, the loosened material is removed and the bottom swept, so as to ensure a good key for the hot-mix specially designed asphaltic concrete mixture, containing between 60 and 65 per cent aggregate. This material is then spread and rolled to the required grade. The life of the completed roadway should be from seven to fifteen years, according to traffic. The material was consolidated with an 8- to 10-ton tandem roller, and then ½-inch of fine graded asphaltic concrete was laid as a wearing surface.

—Report of A. H. GARNSEY,
City Engineer.

Canada Building Flying Fields to Relieve Unemployment

IT is reported that the Department of National Defense of the Dominion of Canada is building a chain of aviation landing fields across Canada, the work being undertaken at this time to relieve unemployment. Actual construction of the airports began on November 1, although survey parties have been at work for some time establishing the sites for the proposed fields.

These fields will be in the nature of emergency landing fields along three stretches where no landing fields now exist, according to the reports of the United States Department of Commerce from the Consulate-General at Ottawa. The stretches to be covered are from Halifax to Montreal, from Ottawa and Toronto to Winnipeg, and from Lethbridge, Alberta, to Vancouver, British Columbia.

About 2,000 men are expected to receive employment in this work and will be stationed in camps near the proposed landing fields throughout the construction period.

See These Articles

On page 43—"Low-Cost Road Construction with Asphalt Emulsions."
On page 47—"Resurfacing Brick with Brick—An Economical Practice."
On page 63—"Pick-up Sweepers and White Wings."

A Way to Prevent Snow-Plows from Being Stuck in High Drifts

OFTEN a truck with a snow-plow will become "skew-geed" between high snow banks when bucking large drifts. Then it is a difficult job to get straightened out in order to back up for another push. If the operators will carry a couple of pieces of bridge plank 3 by 12 inches about 8 feet long and, when the truck becomes angled between the banks, place these planks on edge between the snow bank and the bottom of the wedged tires, the wheels will slide along the planks instead of pushing farther into the bank and the truck will straighten out while backing up a few feet.

L. L. LOWRY,
County Engineer, Howard County, Cresco, Iowa.

Public Works Engineers Not Given Authority Commensurate with Responsibility

ON October 31, 1932, the Dean of Engineers in New York City retired after 48 years of active engineering service for various city departments. Robert Ridgway has seen nearly half a century of work in building a portion of the vast water-supply system and subway transportation facilities of the great metropolis of the eastern seaboard. He held his position through many political dynasties and upheavals and has always kept himself above politics and its reproaches. Upon his retirement at the age of 70, a dinner was given with Mr. Ridgway as guest of honor. After eulogies had been expressed by representatives of different groups, Mr. Ridgway himself spoke feelingly of his interesting contacts and the work of his associates in the past 48 years. He spoke particularly of the position of engineers in municipal departments, saying: "It is always the fashion among shallow-pated critics to belittle the work of the public departments and their engineers. I half believed them when I was young." Experience, he declared, has opened his eyes since then and he has "learned there is as much ability and honesty of purpose in public life—perhaps more so—than there is in private corporations. The great trouble with public departments is that commensurate authority is not usually given with the responsibility of office. If that could be done, and if public servants were held to a strict accounting for the use of authority granted them, there would be an immediate rise in efficiency, but it seems impossible to accomplish this."

The city chiefs wanted *Proof*

—so we crashed into the hydrant and repaired it within half an hour

On December 16th, a number of water department superintendents and engineers of the State of Maine watched while an automobile truck smashed into a Kennedy SAFETOP Fire Hydrant which was connected to the supply main with full city water pressure of 80 pounds.

When the heavy truck struck the SAFETOP Hydrant, the patented Safety Breakable Section broke cleanly apart. The entire upper standpipe section assembly, dislodged from the base, fell to the ground. The driver was merely jarred, and the only damage to the truck was a bent bumper. No part of the upper or lower hydrant standpipe or stem sections or operating mechanism was damaged, nor was there any flood.

The superintendents and engineers were amazed, but an additional surprise awaited them. After the truck was backed away, the Kennedy representative started to repair the broken hydrant. It was a bitterly cold day, and the sub-zero temperature made it difficult to handle the castings, but in spite of this handicap, a new standpipe breaking ring and stem coupling were set in place, the upper standpipe section assembly replaced, and the hydrant was again ready for service in 26 minutes—the repair parts costing $6.00.

No excavating was required, nor was it necessary to shut off the water pressure at any time, and when the hydrant was opened at the conclusion of the test, it was found to be in perfect operating condition.

The Kennedy Valve Mfg. Co.
Elmira, N. Y.
Representatives in Principal Cities

The Kennedy SAFETOP Fire Hydrant is amply strong to withstand without injury any impact that fire hydrants now commonly used will endure without breaking. In case of a severe smashing impact however the standpipe breaking ring and stem coupling break cleanly apart without injury to upper or lower section of the standpipe or stem.

An additional advantage of the SAFETOP Hydrant is that the nozzles can be rotated exactly to any desired position without disconnecting any parts or removing bolts.

Write for complete information

KENNEDY
SAFETOP Fire Hydrant
Patented

Sewage Treatment Means Clean Streams

SEWERAGE and SEWAGE DISPOSAL

Constructing a Sewer Outlet

WHEN it was decided to construct a trunk line sanitary sewer to serve the south portion of the city of Washington, Mo., it was felt necessary to submerge the outlet end of the pipe 6 feet below the low-water level in the Missouri River, into which the raw sewage was to be discharged. A relatively high ridge extending from east to west paralleling the Missouri River in the city prevented the 1,500 residents residing on the south side of this ridge from using the trunk sewer line serving the other 4,500 population living on the north side of the ridge. Thus a pumping plant would have to be built or a trunk line extended from west to east through the valley a sufficient distance to secure a gravity flow into the river. The latter course was taken as the more economical.

To construct the outlet 6 feet below the low water, 160 feet of 10-inch pipe was required. Dublex Simplex river crossing pipe made by the American Cast Iron Pipe Co. was used for this purpose. Two joints of the pipe were laid, as the first step in the construction of the work, from a manhole on the river bank to the edge of the water. When the river was at a low stage, it was found that three more joints could be laid in a dry trench. This left five joints to be lowered into the water, which was 10 feet deep at the end of the proposed line. This was done by the use of a sand barge anchored to the river bank, and required a crew of ten men about four hours to excavate 50 feet of trench, convey the pipe to the proper location, prepare the joints, and lower it into place. A smaller crew could have been used but the contractor decided to use a larger one, to be sure of completing the work on time.

W. L. GILLUM,
City Engineer.

Standardization of Cast Iron Soil Pipe and Fittings

THE standardization of cast iron soil pipe and fittings was actively undertaken by the industry in January, 1931, with the American Society of Sanitary Engineering and the American Society of Mechanical Engineers as joint sponsors under the procedure of the American Standards Association. The task of dividing the first tentative proposal was tackled at once. The work was developed into three subdivisions: (1) nomenclature; (2) materials, marking and inspection; and (3) dimensions and weights. A standard nomenclature has been completed, consisting of terms and names of the component parts of soil pipe and fittings which it is proposed to recommend to eliminate confusion. The work on materials, markings and inspection has resulted in the development of a simplified specification compared with that now in use, which is nevertheless more rigid in the essential features. The question of dimensional standards and unified weights for soil pipe with fittings. The report will include the fol- fittings is ready for final approval by the subcommittee, and for distribution to the industry at large for review and comment.

Standard dimensions for soil pipe and fitting dimensions have been divided into four parts: (a) soil pipe, sizes 2 inches to 6 inches; (b) soil pipe, sizes 8 inches to 15 inches; (c) soil pipe fittings, sizes 2 to 6 inches; and (d) soil pipe fittings, sizes 8 to 15 inches.

In the study of soil pipe, sizes 2 inches to 6 inches, it was found that weights for this pipe as indicated in the specifications did not agree with the dimensions. As a result, the inside diameters of the present pipe are less than those of the fittings. This is a justifiable ground for criticism which the industry has recognized for a long time. The Committee will therefore recommend that the weights of the pipe be reduced slightly in order that the pipe and fittings may carry the same inside diameters. The proposed standard dimensions and weights for 2- to 6-inch soil pipe are given below:

Size (in.)	Outside Diameter (in.)	Approximate Wall Thickness (in.)	Weight per 5-ft. Length (lb.)
2	2⅜	3/16	25
3	3½	¼	45
4	4½	¼	60
5	5½	¼	75
6	6½	¼	95

The Committee is of the opinion that in proposing the following dimensions and weights for 9-inch to 15-inch soil pipe all factors have been given due consideration:

Size. (in.)	Outside Diameter (in.)	Approximate Wall Thickness (in.)	Weight per 5-ft. Length (lb.)
8	8⅝	5/16	150
10	10 11/16	11/32	215
12	12¾	⅜	275
15	15⅞	7/16	375

Intensive study has been given to the simplification of the list of approved fittings. The report will include the following items for sizes 2-inch to 6-inch and a corresponding list for sizes 8-inch to 15-inch: ¼, 1/5, 1/6, ⅛ and 1/16 bends; return bends; long and short sweep ¼ bends; double ¼ bends; double spigot and low heel inlet ¼ bends; long ¼ bends and long ⅛ bends; single, double and long Y branches; combination Y and ⅛ bends single and double; inverted single and double and upright Y branches; T and tapped T branches (approved for venting and cleanout purposes only); sanitary single and double and tapped T branches; long sanitary T branches; vent branches, reducers, increasers, long increasers, double hubs; plain and hub vented running traps; plain and hub vented ½ and ¾ S traps; S traps plain and hub vented; traps with cleanout tapping; ⅛ bend offiset; extension pieces; T and Y cleanout brass trap screw-on branch; Y cleanout with brass trap screw-on main; combination Y and ⅛ bend cleanout w/brass trap screw-on main; pipe plugs and iron body ferrules.

This list of fittings for sizes 2-inch to 6-inch now includes 41 separate and distinct items, and the list for sizes 8-inch to 15-inch includes 19 items. It has been the aim of the Committee to reduce the number of fittings to a minimum consistent with the demands of the trade and yet maintain a sufficient variety of fittings to meet the requirements most efficiently. As a result, the Committee has eliminated from its proposal 36 items, or approximately 38 per cent of all the items at present manufactured. The fittings eliminated are those now obsolete or inconsistent with sanitary practice. Copies of the proposed American Standard Cast Iron Soil Pipe and Fittings will be ready for distribution in the near future and may be secured from C. B. LePage, Assistant Secretary, A. S. M. E., 29 West 39th Street, New York.

East Peoria Kept 218 Unemployed Men Busy

LAST winter the city of East Peoria, Ill., found a way of doing some needed work and at the same time giving employment to many men who would otherwise have been jobless. A Caterpillar tractor and a 20-cubic-foot Sauerman Crescent drag scraper were taken to the banks of Farm Creek, a small tributary of the Illinois River which East Peoria utilizes as a drainage channel, and in a single operation cleared out the channel and provided material for municipal improvements.

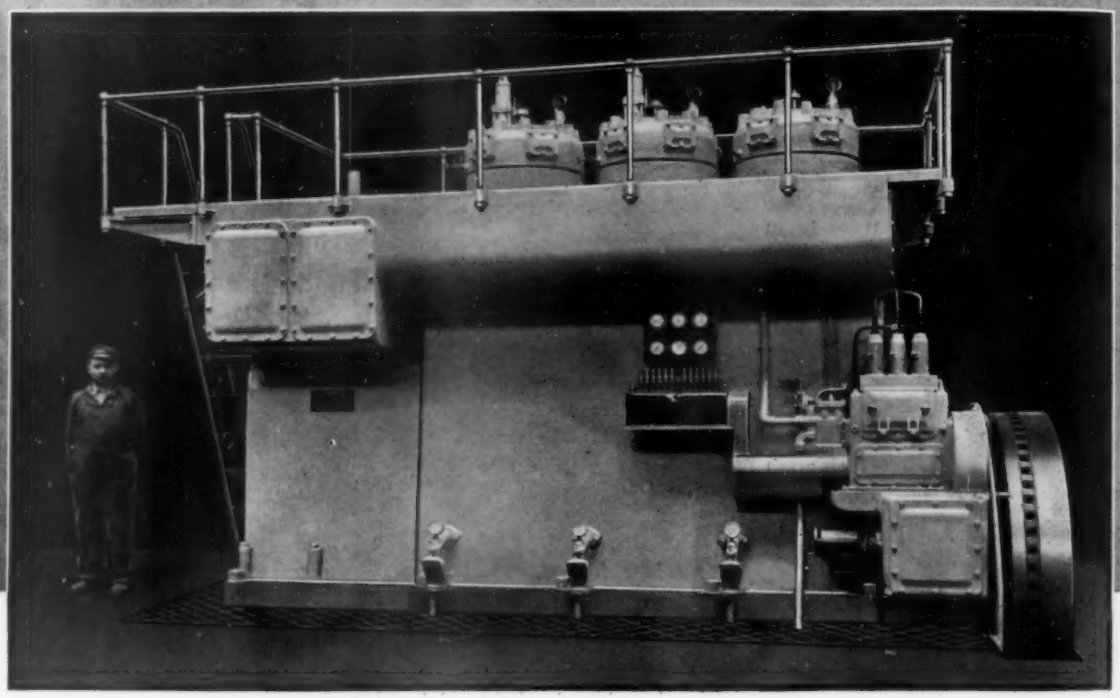
Farm Creek fills up gradually with sediment, much of which is good sand and gravel. The operating cables for the drag scraper, running from a Willamette-Ersted double-drum automotive hoist mounted on the tractor, were stretched across the creek bed, and the scraper dug away the material that was obstructing the stream and piled it up on the bank. This material was then loaded by hand into motor trucks and hauled to the roads in the city park system, where other crews of men were kept busy spreading it. The work that was thus made possible with the output of the one excavator gave employment in all to 218 men.

WILLIAM CARROLL,
Street Commissioner.

Now Available—

In Mechanical Injection

and with a low fuel consumption of .39 lbs. per brake horsepower hour



Three cylinder, 750 horsepower arranged for mechanical-injection

Besides this line of two-cycle engines, which may be had in sizes from 750 to 3000 horsepower, either mechanical or air-injection, trunk piston or crosshead construction, other Nordberg Diesel designs are available in sizes ranging from 150 to 22,500 horsepower. For every power need there is a Nordberg Diesel that serves dependably and produces power at a low cost consistent with modern Diesel practice.

NORDBERG MFG. CO., MILWAUKEE, WIS.

NORDBERG

Do you mention THE AMERICAN CITY? Please do.

Who's Who in City & County Engineering

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since Apirl, 1928

JUL. L. MUELLER
City Engineer
Maplewood, Mo.
(Appointed 1927)

WILLIAM H. WILSON
City Engineer
Chattanooga, Tenn.
(Appointed 1928)

FRANCIS O. STONE
County Engr., Lackawanna Co.
Scranton, Pa.
(Appointed 1912)

THOMAS J. DALEY
City Engineer
Camden, N. J.
(Appointed 1923)

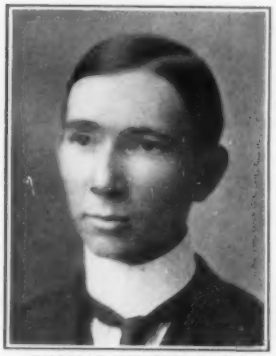
ALLEN WALLEN
City Engineer
Iowa City, Iowa
(Appointed 1928)

DAN H. VINCENT
City Engineer
Big Rapids, Mich.
(Appointed 1917)

P. L. BROCKWAY
City Engineer
Wichita, Kans.
(Appointed 1917)

A. A. RHOMBERG
County Engineer, Dubuque Co.
Dubuque, Iowa
(Appointed 1928)

JAMES W. COSTELLO
Chief Engr., Dept. of Public
Affairs, Newark, N. J.
(Appointed 1921)



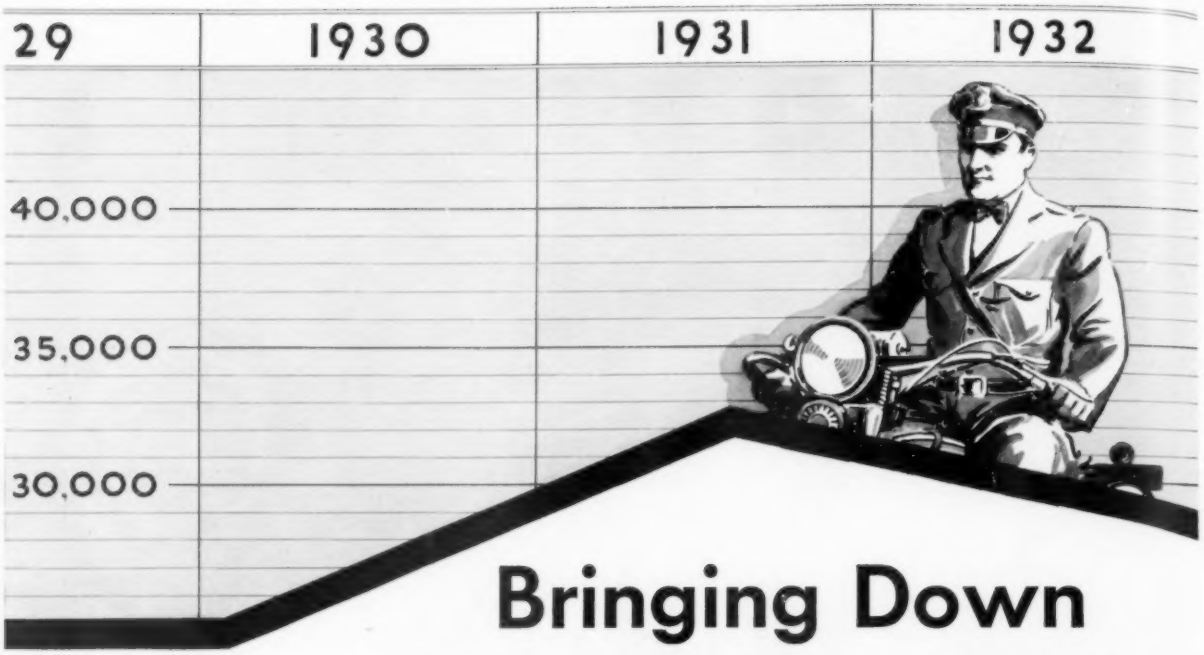
THOMAS SIMEON LANG
City Engineer
Clarksburg, W. Va.
(Appointed 1918)

J. M. TIPPEE
City Engineer
Des Moines, Iowa
(Appointed 1928)

H. W. WRIGHT
City Engineer
Bangor, Maine
(Appointed 1929)

BENTON R. ANDERSON
City Engineer
Clinton, Iowa
(Appointed 1922)

W. P. NORRIS
County Engineer, Page Co.
Clarinda, Iowa
(Appointed 1926)



Bringing Down the DEATH CURVE

INSURANCE COMPANIES report that the 1932 toll of auto-accident deaths probably will be 5000 *lower* than 1931.

Good news! How much of the decrease is due to lower auto registrations and mileage is debatable—but the Motorcycle Policeman deserves a big share of the credit.

City after city, county after county, has turned to the Motorcycle Officer as the surest safeguard against traffic casualties. In steadily growing numbers, he is saving lives every day—making motorists drive sanely.

That the Motorcycle Officer uses more Harley-Davidsons than all other makes put together, is a fact of which we are naturally proud.

Still More Motorcycle Policemen Are Needed

Is your community adequately patrolled, or is it under-motorcycled? . . . . Look over our Police Literature—it contains many interesting facts on traffic control, police motorcycles, and our 1933 models. A postal will bring it.

HARLEY-DAVIDSON MOTOR COMPANY
DEPARTMENT M MILWAUKEE, WISCONSIN

HARLEY-DAVIDSON

The Police Motorcycle

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Berkley, Mich.

The village of Berkely, population 5,571, collects all garbage, using a 1-ton Chevrolet dump truck, which delivers the garbage to a piggery.—CHARLES M. HIGHLEY, Superintendent of Department of Public Works.

Grosse Pointe Park, Mich.

Two 2-ton Ford trucks are used by the city of Grosse Pointe Park, population 11,174, for the collection of garbage throughout the city. The garbage is transferred to the city of Detroit for disposal.—WALDO J. BERNS, Village Clerk.

Monroe, Mich.

The city of Monroe, population 18,110, collects garbage in the city, making a charge of $5 per year for each family desiring the service. The city uses one motor truck for collection and disposes of the garbage on a local dump.—JOHN H. EBER, City Clerk.

Niles, Mich.

The city of Niles, population 11,326, makes a two-year contract with an individual for the collection of garbage. The present contractor uses two 1½-ton trucks with dump bodies and disposes of the garbage by feeding to hogs and plowing under the excess.—C. G. WASSON, City Clerk.

Pontiac, Mich.

Municipal collection of garbage is in force in Pontiac, population 64,928. The city uses five 1½-ton 4-cubic-yard trucks for collection and disposes of the garbage by incineration.—ALFRED E. HANSEN, Superintendent of Garbage.

Sturgis, Mich.

The city of Sturgis, population 6,950, has contract collection of garbage. The contractor is paid by the city. He uses motor trucks for collection and disposes of the garbage by feeding to hogs.—R. BIEHL, City Manager.

Brainerd, Minn.

There is no regular system of garbage collection in Brainerd, population 10,221, five individuals being paid by householders and owners of eating places to collect most of the garbage, while a great number of householders burn their own garbage or haul it to the city dump in their own vehicles. The vehicles in use by those who make a business of collecting garbage consist of three 1-ton trucks, one ½-ton truck, and one 1-yard trailer pulled by a Model T Ford.—R. T. CAMPBELL, City Engineer.

Hibbing, Minn.

The village of Hibbing, population 15,666, collects garbage with six motor trucks equipped with 4 1/3-yard steel dump bodies. The garbage is disposed of in the municipal incinerator.—HUBERT F. DEER, Village Recorder.

Ely, Minn.

The city of Ely, population 6,156, collects garbage as a municipal service, using one 3-ton motor truck equipped with a watertight body. The garbage is disposed of by dumping into pits beyond the city limits, which are covered with gravel and dirt as they are filled with garbage. All garbage is hauled at night.—A. O. KNUTSON, City Clerk.

Little Falls, Minn.

A contractor who is paid by the householders collects the garbage in Little Falls, population 5,014, using one wagon, and disposes of the garbage on the city dump about a mile from the corporate limits.—ANDREW JOHNSON, City Clerk.

Moorhead, Minn.

The city of Moorhead, population 7,651, makes a contract with one individual for the collection of garbage in the city, but the contractor is paid by the individual householder. The contractor uses one 2-yard motor truck and disposes of the garbage at a local dump.—R. G. PRICE, City Clerk.

Rochester, Minn.

Municipal collection is in force in Rochester, population 20,621. The city uses one wagon and one motor truck for collection and disposes of the garbage by feeding to hogs.—D. C. LOCHEAD, Deputy City Health Officer.

Biloxi, Miss.

The city of Biloxi, population 14,850, collects the garbage daily with three 1½-ton motor trucks, and on Saturday with four 2-horse-drawn wagons. The garbage is burned daily.—JOHN A. SWANZY, Commissioner of Public Works.

Brookhaven, Miss.

Garbage is collected by the city of Brookhaven, population 5,288, with one 5 x 10-foot wagon and one 1¼-yard motor truck. It is disposed of by burning on a dump and then covering with earth.—A. E. MORETON, Street Commissioner.

Tupelo, Miss.

The city of Tupelo, population 6,361, collects the garbage with eight 2-horse wagons and disposes of it on an open dump.—J. H. MERRITT, City Clerk.

Havre, Mont.

In Havre, population 6,372, the city collects all the garbage within the corporate limits, using one 1½-ton, 3-cubic-yard capacity motor truck. The garbage is disposed of by dumping.—E. SANDQUIST, City Engineer.

Reports from cities all over the United States appear in these pages. Compare organization and methods—it pays.

THE DUMPING PLATFORM OF THE HAMILTON, ONTARIO, INCINERATOR, WHICH HAS A DAILY CAPACITY OF 150 TONS

A fleet of ten 2-ton, 6-cylinder International trucks of 156-inch wheelbase and with Wood hydraulic hoists and steel bodies of 5-cubic-yard capacity are used for collection. Each truck is manned by a driver and two loaders. Three times as much garbage is being collected by these trucks in a week as by the old method and at a saving of 40 per cent in operating costs. The receiving pit at the incinerator, shown in the illustration, runs along the dumping platform for the full width of the building. Two 3½-ton electric cranes are used to handle the garbage from the pit to the furnaces

BROUGHT FIRE APPARATUS TO OUR DOOR Before We Knew There Was A Fire

Here is a case—typical of the many we learn of—where the Gamewell SPRINKLER WATCHMAN proved its worth in actual service. It brought the firemen to the scene before the occupants of the building knew there had been a fire and their sprinkler system was operating. The president of the company says: "It saved us from considerable water damage."

Since this letter was written the SPRINKLER WATCHMAN once more saved the J. A. Kirven Company from heavy water damage when an overheated furnace again caused a sprinkler head to open.

The SPRINKLER WATCHMAN is the most reliable, rapid and economical sprinkler supervisory service that can be obtained. It utilizes a Gamewell Master Type Fire Alarm Box to connect the sprinklers to the municipal fire alarm system. Thus, it makes every sprinkler system an automatic fire alarm system—every sprinkler head a fire department nerve.

J. A. Kirven Company
DEPARTMENT STORE
Columbus, Ga.

October 24, 1932

Mr. T. F. Tillman,
Supt. of Fire Alarms,
Columbus, Georgia.

Dear Mr. Tillman:-

Replying to your inquiry as to what we think of Gamewell master fire alarm boxes, wish to say our experience with them has completely sold us.

For your information, on November 20th., 1929, a box of trash was left too close to the furnace in the boiler room, it caught fire, causing a head of an automatic sprinkler to go off, thereby tripping the master fire alarm box, which in turn brought the fire department to our store. When they arrived the water had extinguished the blaze, and the funny thing about it was, we never knew anything had happened until the fire trucks came clanking to our doors. The firemen cut off the water and saved us from considerable water damage. The facts are we did not have any water damage, which goes to prove we have a very efficient fire department.

Very truly yours,

J. A. Kirven Co.,

JDK:T

J. D. Kirven,
PRESIDENT.

A Box A Block

THE GAMEWELL COMPANY
NEWTON, MASSACHUSETTS

Fire—Police—Safety Items

of Interest to Departments of Public Safety

Charlotte Fire Department Seeks Increased Facilities to Improve Its Good Work

THE fire department of Charlotte, N. C., has been producing excellent results, particularly in fire prevention work, even with limited facilities.

In the report of Captain H. C. Kissiah of the fire prevention division, for 1932, rendered to Chief W. H. Palmer, it is stated:

"The number of fire alarms has been reduced each year, and the number of inspections has been twice that formerly made each year. Many fire hazards, which formerly existed, have been removed. General conditions show a marked improvement. Better results are being obtained by inspectors, as they are becoming more familiar with their work, and the public is becoming more appreciative of our efforts, as the inspectors are being received very courteously everywhere.

"However, with only two men assigned to regular duty, and members of the department detailed quarterly for this work, it is impossible to carry on an adequate system of fire inspection. The high-value district should be inspected at least once each 30 days. This, in my opinion, can be done without additional cost to the department.

"The Night Fire Patrol, which has discovered several fires in their incipiency, has been of inestimable value in keeping our fire loss down.

"Our per capita fire loss was reduced from $7.30 in 1930 to $3.19 in 1931. The year of 1932 would have shown further reductions but for a series of circumstances seemingly beyond our control. A number of fires occurred in December which will bring our fire loss to $353,026 for the year, as against $259,324 for 1931.

"The fact that for eleven months of the year, with daily inspections by regular inspectors, quarterly inspections by men detailed from the department, and the night fire patrol, we have kept our fire loss to a minimum, is evidence that the fault is not wholly attributable to our neglect.

"The fact that 99 per cent of fires were confined to place of origin speaks for the efficiency of the fire department in the extinguishing of fires."

Chief Palmer gives us the following additional interesting information:

"Charity labor has been used to clean off the creek banks and grass and rubbish from vacant lots and fields.

"We have a young man in the department who has passed the state bar examination and handles the investigation of fires."

In order further to increase the efficiency of the department Chief Palmer makes the following recommendations:

First—That the city of Charlotte install at least 100 fire hydrants, to be located in sections where they will serve the most people for fire protection and will also be a great saving to the taxpayers on their insurance rates, as a good many citizens are penalized for not having fire protection, while some of their neighbors a few blocks away are enjoying a lower rate of insurance.

Second—That there be installed at least 100 fire-alarm boxes. Owing to the fact that a number of telephones have been disconnected the fire department has been handicapped on account of not having received an alarm of fire in time to be of aid. In some places heavy losses have occurred owing to delay in alarms. We have some closely built sections which are now one and one-half miles from the nearest fire-alarm box.

Third—That there be purchased a truck to be equipped with a lighting system of sufficient size to light up buildings at night, which will enable the firemen to work more efficiently. This car should be equipped with a lighting system, tarpaulins, jacks, pull-down hooks, welding outfit, gas masks, and other tools which are badly needed.

Fourth—For the past several years I have recommended that the city of Charlotte install a Drill School in the fire department. This would greatly increase the efficiency of the department because each man could be trained in advance in what to do in case of fire, in the protection of life and property.

A Double-Duty Police Sidecar

THE police department of Oslo, the capital of Norway, has a fleet of late-model motorcycles, but their newest machine, while of the same make, is a unique combination, developed locally.

In regular service the machine is operated as shown herewith, carrying a crew of four officers. In emergencies the sidecar can be converted into a highly mobile ambulance. Two extra cushions ordinarily carried under the seats can quickly be placed in position to form a long and comfortable bed on which an injured person can be carried almost as smoothly and easily as on a stretcher.

The motorcycle is a regular Harley-Davidson VS model. The sidecar, in order to handle two sturdy policemen, is mounted on a package truck chassis, capable of carrying a quarter ton, instead of the standard touring sidecar chassis. The 28-horsepower motor has ample reserve power to take care of all requirements.

President's Committee Cites Advances in Police Work

IN the chapter on "Crime and Punishment," in the recent report of the President's Research Committee on Social Trends, a gradual increase in the amount of crime is recognized, but the existence of a "crime wave" is denied. The organization of criminals has developed considerably in the last decade and a half, and such organization is expected to continue, although large-scale organizations that have profited largely from bootlegging will tend to break down if liquor sales are legalized. No substantial decrease or increase in the number of crimes is hoped for in the immediate future.

The authors of the chapter, Edwin H. Sutherland and C. E. Gehlke, Professors of Sociology at Chicago and Western Reserve Universities, respectively, refer as follows to advances in police work:

"The agencies of criminal justice have not developed sufficiently to enable the state to cope successfully with the problem of crime. This is not because of evident deterioration in the police, the courts and the penal institutions, but because of the failure of these agencies to keep pace with the growing difficulties of the situation. The police have shown, in a few places, more promise than any other agency of criminal justice.

"The results of physical sciences have been applied in the detection and identification of criminals, in communication, and in other ways; and the best practical knowledge available has been utilized in the organization of work and promotion of cooperation and of morale. In few other branches of criminal justice is the enthusiasm in the small groups of leaders so great as in the police field, and in few other branches is the number of persons approaching the problems with a professional interest so great as in the police field. But these developments have, in general, been confined to a small number of places, while in many other places appointments are determined by patronage, work is conducted primarily with reference to political considerations, and graft, inefficiency and brutality prevail."

Crime Rate Drops, Then Rises

THE daily average rate of robberies, burglaries and thefts known to the police in 1,206 cities decreased during the first six months of last year, but increased again in the second half, the United States Bureau of Investigation announced February 23 in its quarterly uniform crime report.

Moving coughless carloads at lowest cost per mile

Next time you're out on the street—or country highway—watch for all the Chevrolet commercial cars and trucks! Make a mental note of *how many* you count—and *what names* are on the sides. If you don't happen to be well posted on today's fleet-business situation, you're likely to be surprised at what you find. For today, leading nationally-known firms, like P. Lorillard Co., whose judgment every business man respects, are buying Chevrolets in impressive numbers—*and coming back for more!* It's a matter of established record with them, that Chevrolet is THE car or truck to buy—when expenses must be *kept down to rock-bottom.* It's the only lowest-priced vehicle with that matchless combination of SIX cylinders—OVERHEAD valves. It's a notably well-built, solidly-constructed unit that requires the very minimum of service! And it's backed by the greatest motor car service organization in America—offering the lowest charges in the industry for many repair operations. In the experienced judgment of leading firms: Chevrolet offers American business *the world's most economical form of motor transportation!* That's why cars like the one above are a familiar sight on every mile of American highway today.

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Illustrated is the Chevrolet Sedan Delivery, $545. Chevrolet trucks priced as low as $440. Chevrolet passenger cars priced as low as $485. Prices f. o. b. Flint, Michigan. Special equipment extra. Low delivered prices and easy G. M. A. C. terms. A General Motors Value.

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Keep your files up to date by checking over these items each month and writing for those you need.

SAFETY TORCHES FOR DEPENDABLE PROTECTION

311. Toledo warning torches with the special burner which will not blow out and which are dependable and economical are described in the literature of The Toledo Pressed Steel Co., Toledo, Ohio.

TIRES FOR TRACTORS, GRADERS AND MAINTAINERS

312. The B. F. Goodrich Co., Akron, Ohio, will be glad to send to those interested its 10-page booklet describing the Goodrich Zero Pressure tire, which is designed for use on tractors, graders, mowers, maintainers and similar equipments.

A NEW INDUSTRIAL POWER UNIT

313. Folders 1601 and 1603 recently issued by the Caterpillar Tractor Co., Peoria, Ill., describe the stationary power units which that company is now marketing and which are used as power for the Caterpillar Sixty-five and Twenty-five tractors. These folders also list the complete Caterpillar engine line, for the information of municipal engineers and contractors.

SEWAGE DISPOSAL EQUIPMENT

314. Bulletin 545 issued by The Jeffrey Mfg. Co., 970-99 N. Fourth Street, Columbus, Ohio, describes some of the proved sewage disposal equipment offered by Jeffrey, including self-cleaning bar screens, grit conveyors, sludge collectors, shredders, etc., which have been installed in many progressive cities throughout the country.

MUNICIPAL PROPERTY PROTECTION

315. The Stewart Iron Works Co., Inc., 915 Stewart Block, Cincinnati, Ohio, manufactures staunch Stewart iron or chain link fences which work 24 hours a day protecting and beautifying municipal property. Literature on "Municipal Property Protection" may be secured from this company free on request.

NEW COMPLETE LINE OF BITUMINOUS ROAD AND STREET MACHINERY

316. The descriptive catalog of the Chausse Oil Burner Co., Elkhart, Ind., gives specifications and illustrations of the new Chausse complete line of bituminous road and street machinery for making both hot and cold mixes. This line includes portable road-mix pavers, central cold mixing plants, pugmill mixers, hot and cold pre-mix plants, driers for sand and stone, street repair patchers, asphalt plants, tar kettles with spray pumps, and surface and tool heaters.

TRUSTY WATER METERS

317. Poor quality water meters will pick pockets in your possible revenue just as surely as if nimble fingers filched your wallet. You must have good water meters. Nearly six million Trident and Lambert meters have been made and sold all over the world and have maintained their reputation for sustained accuracy for low maintenance and depreciation and long life. Trident and Lambert meters are made in every type for every problem of increased water revenue. Send for catalogs to the Neptune Meter Co., or the Thomson Meter Corp., 50 E. 42nd St., New York.

FROST-PROOF HYDRANTS

318. Eddy fire hydrants, in which a damaged valve can be replaced in a few minutes at slight expense,—and should the standpipe be broken not a drop of water need be lost,—and which are frost-proof, are described in the literature of the Eddy Valve Co., Waterford, N. Y.

FLEXIBLE STEEL PIPE COUPLINGS

319. To the inherent flexibility of the coupled joint, Dayton couplings made by the Dayton Pipe Coupling Co., Dayton, Ohio, add the strength of all-steel construction. Once installed on a pipe line, the Dayton couplings become a stable investment in permanent and unfailing service. As long as the Dayton-coupled line is in use, all connections remain strong and flexible, absolutely tight and leak-proof. Complete information may be secured direct from the manufacturer.

HOW TO ASSEMBLE DATA FOR R. F. C. LOANS

320. Ford, Bacon & Davis, Inc., 39 Broadway, New York, have prepared a general bulletin on the requirements of a self-liquidating type of loan, the types of projects eligible and other pertinent information on the R.F.C. Copies of this bulletin may be secured by writing to Ford, Bacon & Davis, Inc.

PORTABLE ASPHALT MAINTENANCE PLANTS

321. Bulletin R-400 issued by Hetherington & Berner Inc., Indianapolis, Ind., describes H & D portable asphalt maintenance plants with a capacity of 400 yards per day with accurate control of materials, assuring an accurate mixture to comply with any standard specifications.

SPEND MUNICIPAL FUNDS LOCALLY

322. Needed expansion of water mains is a type of work which can be done through R. F. C. financing. By using Lock Joint pipe manufactured in your own city, using local labor and materials purchased from local merchants, most dollars go back to the pockets of the local taxpayers. For full details write to Lock Joint Pipe Co., Ampere, N. J.

CONTROLLING ALGAE AND SLIME

323. HTH is a stable, dry, readily soluble calcium hypochlorite more than twice as concentrated as ordinary chlorinated lime, and it does not lose its exceptionally high strength during either winter or summer, even in long periods of storage. Its use requires no special equipment and involves no returnable containers. HTH is shipped in cases of one dozen 4-pound cans, and HTH-technical in 110-pound drums. Full information may be secured from The Mathieson Alkali Works (Inc.), 250 Park Ave., New York.

A CATALOG OF WATER-WORKS NECESSITIES

324. Catalog G issued by Rensselaer Valve Co., Troy, N. Y., pictures and gives specifications for Rensselaer valves and Corey hydrants, tapping sleeves, tapping valves, crosses, split repair sleeves, post indicators, floor standards, air valves, valve boxes, grease cases, etc.

DRINKING FOUNTAINS THAT DON'T SPREAD GERMS

325. Many vital improvements have been made in drinking fountains, but heading the list is the R-S Vertico-Slant sanitary drinking fountain, which stops germ-spreading. This fountain never feels the touch of contaminated mouths and lips and prevents them from even coming close to the jet that spouts the water. Vertico-Slant fountains are described in detail in the bulletin of Rundle-Spence Mfg. Co., 446 N. Fourth St., Milwaukee, Wis.

A NEW APPROACH TO STREET LIGHTING PROBLEMS

326. Cities interested in obtaining the most economical and effective street illumination should communicate with the General Illumination Engineering Co., Carew Tower, Cincinnati, Ohio, which has developed a complete consulting service to meet all requirements of municipal street-lighting problems and furnish impartial recommendations for obtaining better use of the light purchased.

THE PROTECTIVE VALUE OF PROPER STREET LIGHTING

327. Thirty per cent of the annual toll of burglary and theft, amounting to $262,000,000, can be saved by adequate street lighting, according to a comprehensive study utilizing facts revealed in surveys. Street lighting sufficient to effect this great saving can be attained through an additional annual assessment of only $91,000,000, an investment yielding almost a threefold return. Scientifically designed glassware is essential to correct illumination. Complete information regarding the methods of securing the maximum of protection and consequently the greatest possible return in accident and crime savings may be secured from Gleason-Tiebout Glass Co., 99 Commercial St., Brooklyn, N. Y.

A BITUMINOUS DISTRIBUTOR WITH A CIRCULATING SPRAY BAR

328. Literature describing the new circulating spray bar feature for Etnyre bituminous distributors, which is designed to prevent drip from the nozzles after spraying and which is interchangeable with the regular spray bar on Model F and M distributors already in the field, may be secured by those interested, from E. D. Etnyre & Co., Oregon, Ill.

NEW CAST IRON PIPE AT A SACRIFICE

329. The Acorn Iron and Metal Co., Tennessee and Mediterranean Avenues, Atlantic City, N. J., is selling all sizes of bell-and-spigot, flange and universal pipe, new 14- and 16-inch valves, new hydrants and other materials at a sacrifice. Details and prices on request.

CONSIDER THE BUSINESS-END OF THE WELL

330. When you drill a well, you want an abundant supply of water at the lowest possible original and operating cost. For that very reason it is essential that you pay special attention to the well screen, which is the business-end of the well. Johnson well screens, made in a wide range of metals to meet any conditions of water corrosion, are described in Bulletin A-332 of Edward E. Johnson, Inc., St. Paul, Minn.

DEPENDABLE FIRE PUMPS

331. Thousands of Waterous fire pumps in service have proved their dependability. The catalog of Waterous pumps and Waterous fire hydrants issued by the Waterous Co., St. Paul, Minn., describes these units in detail with illustrations and specifications.

POWDERED CARBON FOR TASTE AND ODOR REMOVAL

332. The use of powdered Hydrodarco, an activated carbon for water purification, is a simple, economical, and universally effective method of removing taste, odor and color-producing substances from water. Bulletin 6005 issued by International Filter Co., 59 E. Van Buren St., Chicago, Ill., describes recent developments in taste and odor control.

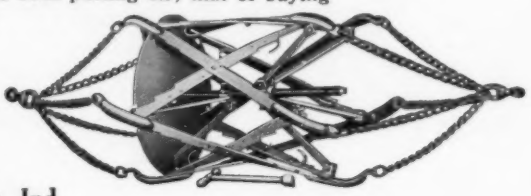
If instead of writing direct to the manufacturer for these catalogs you prefer to send a list of the numbers you desire, to THE AMERICAN CITY, we will secure them for you.

The day the sewers overflowed—

as a matter of fact it wasn't just one day but almost a week. It's true it was a prolonged rainy spell but the water would have been carried away IF———the "if" being the roots and sediment that hadn't been removed. Those responsible for this work then made the decision they had been putting off; that of buying

The Expanding Root Cutter and Sewer Cleaner (Patented)

with removable sediment disc which cleans the entire wall, top, sides and bottom. Double spring steel knives operate in scissorlike fashion when drawn in either direction by windlass at each manhole. No water is needed. Fitted in 30 seconds any sewer 6 to 30 inches. Shipped anywhere on 30 days' free trial. Write today for catalog on complete line of sewer cleaning equipment.



Expanding Sewer Machine Co., Nappanee, Ind.

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The Eddy Valve has a number of distinctive features which it will pay you to study. For example: the gates are free to revolve on the trunnions, so as not always to seat in the same position.

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2500 ROOMS — $2.50 UP

LEONARD HICKS, *Managing Director*

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MARCH, 1933

Vol. XLVIII, No. 3

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

For Clear Thinking on Public Spending

NEVER before, probably, in American history have conscientious public officials been so greatly puzzled as to their proper attitude towards public spending. Never has there been greater need for clear thinking and for constant realization of the fact that, when citizen groups become vocal, the most clamorous and influential are not necessarily the most enlightened.

The popular target today is the public budget. Elimination of wasteful expenditures is widely advocated and wisely accepted. But when other economies are urged by ardent orators, there is too little recognition of the fact that riotous saving may be even more harmful than reckless spending.

There are, of course, two possible extremes in balancing current budgets: (1) outgo may be depressed to the level of an inadequate income; or (2) income may be raised by taxation or borrowing to the level of an adequate outgo.

In the present emergency attainment of this second alternative may not be everywhere possible; but THE AMERICAN CITY believes that an approximation to it is a much sounder objective than the opposite policy; for we are convinced that along the high road of construction and spending, rather than through the morass of stagnation and hoarding, lies the pathway to economic salvation.

An amazing blindness to the business-creating value of public expenditures is apparent in much of the present clamor. No sane seeker for prosperity urges individual citizens to stop buying food, or clothing, or automobiles, or newspapers—or even cosmetics or tobacco—as aid to the collective welfare. Most of us realize that extravagance rather than parsimony—if we must have one extreme or the other—would be the greater private virtue today. But when it comes to governmental spending, our ardent advocates of budget-slashing would almost persuade us that a reduction in public works would help the construction industry to revive—or that a wholesale slashing of municipal salaries would increase the prosperity and tax-paying ability of local merchants!

The importance of wise and liberal public spending was effectively stated, in a recent radio discussion over a nation-wide network of the National Broadcasting Co., by Dr. Isador Lubin, of the Brookings Institution; Max Stern, of the Scripps-Howard Newspaper Alliance; and Whiting Williams, of Cleveland, Ohio. To quote in part:

DR. LUBIN: As I see the unemployment situation today, we have two alternatives. The first is to let things slide until the curtailment of our industrial output so depletes our stocks of goods that the sheer need for raw and finished materials by those who have purchasing power will put people back in productive work. This is a long and slow process, involving much suffering and destitution.

The other alternative is deliberately to set about to create employment. . . .Under our system of private enterprise, the only force that drives employers to extend operations and take on workers is the prospect of profit. And at present that prospect has all but vanished in most lines of industry. Therefore, if we are to hasten the revival of industry, some organization which does not depend on profits for its motive force must start things going. And the only body of that sort is the government.

It happens that the industry which government could most easily revive is the very one which needs stimulation most—the construction industry. In prosperous years the value of construction approximates $12,000,000,000, or almost one-seventh of our total national income. But this year's construction will amount to just about one-fifth of the 1928 figure. It is estimated that more than two-thirds of the two and one-half million workers directly connected with the construction trades are today out of work. Now, there is need for certain types of government construction which—

MR. WILLIAMS: I'm going to interrupt you there, Dr. Lubin. Granted that what you say is true, you surely are not suggesting that the government could absorb any large portion of these unemployed, no matter how large a building program it undertakes? As I understand it, even in prosperous times the public works expenditures of the federal, state, and local governments, combined, is not more than $3,000,000,000, or about one-fourth of the total spent on all construction.

DR. LUBIN: That $3,000,000,000 has been cut by more than a third during the past year. I was about to suggest that various divisions of our government should step in at this time and instead of cutting down public works expenditures increase them to twice what they ordinarily would have been. This would not only stimulate employment in the construction industry but immediately profitable orders would flow into the iron and steel, hardware, cement, lumber, and a couple of dozen other industries which furnish the materials used in construction. These orders would act as a sort of primer for the entire business machinery. Railroad traffic would pick up. The wages of those re-employed by the building and the material industries would purchase clothes, shoes, and furniture. That would create still more jobs. And so on down the line.

MR. WILLIAMS: That's a real point. As our friend Otto Mallery once put it, "Construction money is soon spent for a thousand commodities that have nothing to do with public works; for instance, chocolates, copper, telephone wire, teddy bears, and soap."

MR. STERN: But how are we going to start public works when everybody is crying for economy in government? The

tax burden is already heavy. And it looks as if we're in for still more.

DR. LUBIN: There is no reason, Mr. Stern, why the cost of a construction program should necessarily be covered by the current tax bill. . . . We do not allow private corporations to charge their long-time capital expenditures to the operating costs of a single year. Capital costs must be spread over the life of each project, and charged off over a period of years. Why doesn't the government do the same thing? A parallel to the way the matter is handled now would be if your 1932 electric light bills had to be swollen by the entire cost of a new power plant which happens to be erected this year by the electric light company.

MR. WILLIAMS: It seems to me, Dr. Lubin, that paying for public construction through a bond issue might merely be a transfer of purchasing power from the bond buyers to the government. The increased demand for labor by the government would be offset by the decreased demand of the bond buyer. If so, the net result would be no increase in the total amount of employment.

DR. LUBIN: Not necessarily, Mr. Williams. *First*, one result of a public works program would be a reduction in the funds required for unemployment relief. So our taxes for relief purposes—and incidentally about two-thirds of our relief funds come from taxes—would be cut. That purchasing power would then be available for other things.

Second, in so far as the bonds are purchased with funds which would otherwise not have been spent immediately, you would increase the country's purchasing power.

And *third*, a large portion of the bonds would be purchased with bank credit, and to the extent that happened, the total purchasing power of the nation would be increased.

MR. STERN: Yes, but if you use bank credit to finance government expenditures you cut down by just so much the credit available for private industry, don't you?

Five Billion Available if Needed

DR. LUBIN: That assumes that the credit available is a fixed sum, Mr. Stern. The fact is that the amount of credit is elastic. Moreover, private industry is not using the credit that is available. Our excess bank reserves today are more than $500,000,000. On the basis of that excess the banks of the country could lend out over $5,000,000,000 if they had to. As you know, each dollar of bank reserves is generally regarded as a basis for ten dollars of bank credit.

MR. WILLIAMS: A minute ago you intimated that a public works program need not necessarily increase taxes in the long run. I cannot see that at all. I'd like to hear more about it.

DR. LUBIN: If we went in for an active construction program at this time it should cover *necessary* projects, which in any event would have to be undertaken in the future. In a sense you would be telescoping the construction of the next two or three years into a single year. In other words, intensive public construction within the next twelve months should mean sub-normal public building after business picks up again. Thus the total amount spent, and consequently the total tax bill over a period of years, should not be any larger than it otherwise would have been; excepting of course the additional interest charges. And, if you take the low construction costs of today into consideration, it is possible that the total tax bill for public works over a given period might even be lower than it otherwise would have been.

Then again, if a building program restores business to any extent, incomes will be increased and tax receipts will automatically rise without having to step up the tax rates. The public works, in other words, might in themselves lead to the creation of the incomes out of which the work would be paid for. In any case, I think you will both agree that it is foolish to expand public building when private construction is active, and to contract the public works program when private enterprise is stagnant, which is what we have been doing. The two types of building should supplement and not compete with each other.

MR. STERN: What would you say, Dr. Lubin, are the best types of public works to start? With what particular construction work would you "prime the business machine," to use your expression?

Needed Types of Public Works

DR. LUBIN: They number in the dozens. There are thousands of miles of main highways yet to be surfaced. Other highways need widening so that traffic may move safely and efficiently. There are flood control and reclamation projects, bridges, water supply and sewer systems, hospitals, national parks and other undertakings too numerous to classify.

MR. STERN: What about schools? I understand that there is a shortage of school buildings in most of our cities, with many classrooms badly overcrowded. Certainly there is a shortage of modern fireproof schools. There's a movement under way now to have the states increase the compulsory school-attendance age to sixteen. That would end child labor, and, according to the United States Commissioner of Education, send into the schools some 2,000,000 children under seventeen who now work for wages. This would not only give adults the 2,000,000 jobs, but it would put an additional number to work building schools, playgrounds, and other equipment to educate the new pupils. And how about railroad grade crossings, which everyone agrees ought to be eliminated? Also, reforestation? Chief Forester Stuart of the Department of Agriculture says there are about 300,000,000 acres of idle land capable of growing trees.

DR. LUBIN: It's that sort of thing I had in mind when I said that a public works program should take care of *necessary* projects. We're going to modernize our schools some day; so why not do it now when we can give work to the unemployed and when costs are lower? The same is true of road widening, grade crossings, reforestation, and so forth.

MR. WILLIAMS: But many of those projects come within the function of the cities and states and most of them are unable to raise any funds right now.

MR. STERN: That could be taken care of by making such projects eligible for loans from the Reconstruction Finance Corporation. And that leads to something that I have been thinking about for a long time. Don't both of you think that the weakness of the bill passed by Congress providing loans for self-liquidating public works is that it leaves out projects that are really self-liquidating even though you cannot measure their returns in dollars? Wouldn't you say that schools, in the sense that they make more efficient and better citizens, are essentially self-liquidating? If parks and playgrounds improve the community's health and cut down illness, should not they also be considered self-liquidating?

The Ultimate Economy of a Public Works Program

ANSWERING the question, "Can we afford it?" Martin Dodge, representing the Banking and Industrial Committee of the Second Federal Reserve District, in a radio address over WOR on January 29, pointed out:

"If we do not spend money in such a way as to provide employment, we shall have to spend it for unemployment; if economy means blind retrenchment, it becomes extravagant; for instance, a wholesale suspension of public works, ostensibly to cut expenses, simply means transferring men from the employment roll to the relief roll, which costs money just the same but adds nothing to the public wealth and makes no contribution to business recovery. Direct relief in many cases is unavoidable, but from an economic standpoint it is also unproductive.

"It is forgotten that taxes required to finance a program of public works will be negligible as compared with shrinkage of values and loss of earnings that result from a continuance of depressed business conditions. Such taxes will be equally negligible when paid out of the earnings of revived trade and industry. The prosperity of our cities is only a reflection of the prosperity of our citizenry. Budgets cannot be balanced by methods that strike down the earning power of those who provide the revenues."

A Deep-Well Water System

By THEODORE REED KENDALL
Engineering Editor, The American City

IMAGINE a plot of ground 3.2 acres in extent which contains some large and attractive trees, several air-lift deep wells, two electrically pumped deep wells, pumping stations, aeration plant, settling basin, filters, standpipe, and wash-water tank, several deer, fish pool, and a pipe yard. If your imagination is good and you look at the photographs with this article, you will have a picture of the water-supply system of Selma, Ala., a city of about 20,000 population, with a daily pumpage of about one million gallons of water, which is 100 per cent metered.

Sources of Water

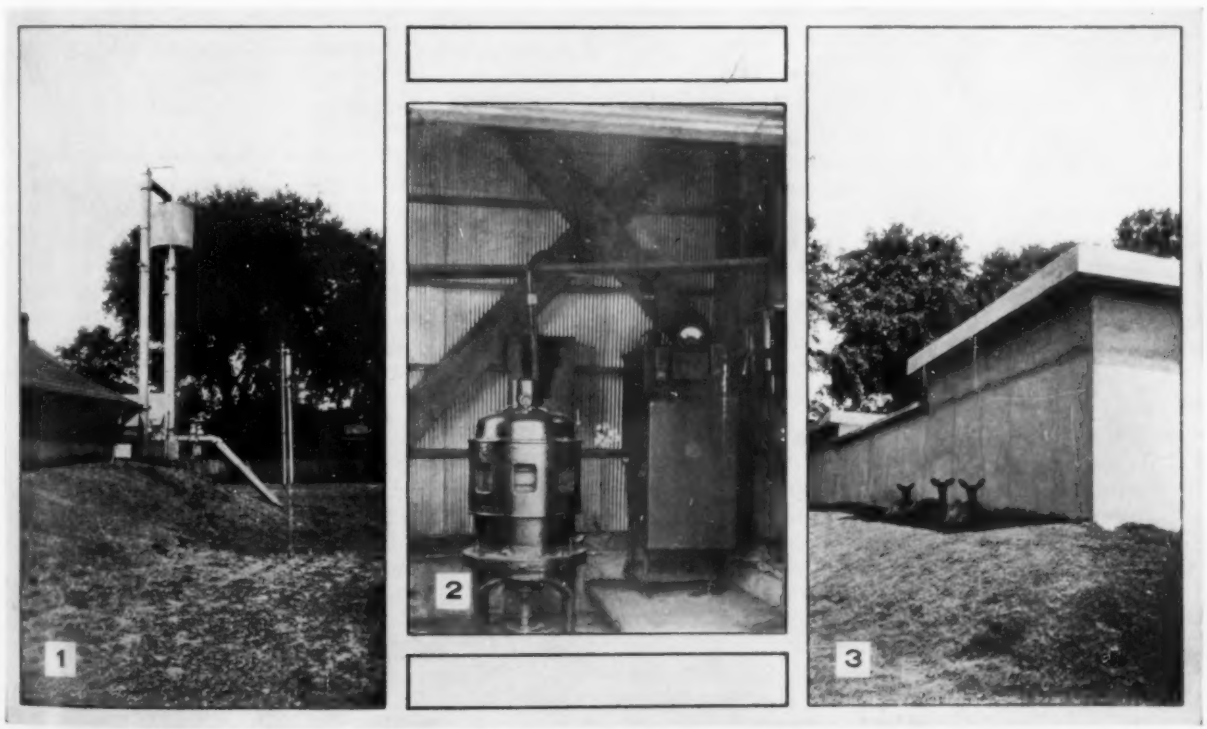
The source of water includes a group of four air-lift wells varying from 450 to 490 feet in length and from 4 to 8 inches in diameter. The 8-inch air-lift well is 470 feet deep and has a 2-inch air pipe; the 6-inch air-lift well is 450 feet deep and has a 1½-inch air line; the 5-inch air-lift well is 465 feet deep and has a 1¼-inch air line; and the other is 490 feet deep and has 1-inch air lines. The 8-inch and the 5-inch air-lift wells have shown tendencies to sand up lately and will have to be run to waste for long periods to get rid of the sand, or be cut out of service.

The Water Department has installed two electrically pumped deep wells. The older is a 10-inch well 460 feet deep with a 10-inch Worthington pump driven by a 50-hp motor. It has a draw-down of 54 feet when operating at full capacity. The new Layne gravel-wall well is 438 feet deep. Water was struck 20 feet below ground level when drilling and the draw-down on the tests was 87 feet. The well starts out with a 26-inch casing at the top for 120 feet, and the rest is 12-inch casing with a 12-inch Layne bronze shutter screen 80 feet long at the end. In order to protect the upper section of the casing from the acid water and also to prevent pollution of the deep well-water with surface water, the new well is protected with a 5-inch concrete casing around the 26-inch iron casing for a distance of 20 feet into the soapstone through which the well goes to reach the water-bearing gravel below.

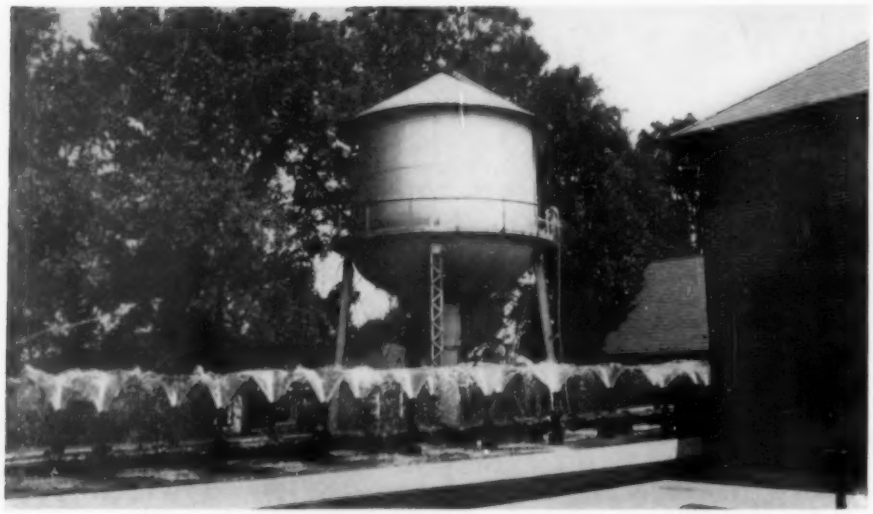
This new well is equipped with a 24-inch Layne single-stage pump which delivers a measured 1,420 gallons per minute against a head of 25 feet above the ground surface with a 50-hp Westinghouse motor on the pump shaft.

Aerators

The pumps deliver the water direct to the aerator system, which is built in duplicate. The aerators consist of 23 heads in each system with 2-inch cone orifice spray heads. The concrete aerator basin on each side is 26 x



VIEWS OF THE SELMA, ALA., WATER WORKS
1. One of the air-lift wells. 2. The 10-inch Worthington 800-gpm deep-well pump, equipped with a General Electric motor. 3. Three pet deer resting in the shade of the aerator wall



ONE SECTION OF THE AERATORS, THE WASH-WATER TANK, AND THE CHEMICAL BUILDING AT THE RIGHT

82 feet in plan, and the aerator heads on 6-foot centers are raised 36 inches above the basin and throw a spray another 36 inches in the air before falling to the basin. There is a 12-inch main with 10-inch branches to each aerator.

The water flows from the aerators to about the center of each basin at the side and through a sand box into the mixing flume, which is 26 feet long, 22 feet deep and 3 feet wide. It contains five vertical baffles each with a 10-inch bell-and-spigot elbow and a 2-foot riser, which thoroughly mixes the water before it goes to the two-compartment settling basin. This basin is 80 feet long by 25 feet wide and turns into another section also 25 feet wide but 56 feet long. This is one half of the settling basin which is duplicated for the other group of aerators. The settling basin is thoroughly cleaned out by flushing every four weeks.

The Filters

The plant has three rapid sand filters each measuring 14 feet 4 inches by 15 feet 3 inches with a capacity of 500,000 gallons per day. The collection system consists of 3-inch cast iron pipe with ⅜-inch holes bored in the bottom of the pipes on 3-inch centers. The filtering media of gravel and sand is built up as follows:

6 inches of 2-inch gravel
5 inches of 1½-inch gravel
4 inches of 1-inch gravel
4 inches of ½-inch gravel
4 inches of pea gravel
36 inches of sand

This gives a total depth of filter of 59 inches. The filters are washed every 72 hours, although the loss of head seldom reaches 4.5 feet in that time. If the filter runs are permitted to become longer, a taste develops in the water that is difficult to account for. The filter control equipment was installed by the McFarland Engineering Co., of Kansas City, Mo.

A wash-water tank of 40,000 gallons capacity is located adjacent to the filter building with the top water level 40 feet above the bottom of the filters. This is filled off the main line from the pumps to the standpipe and is controlled by a float valve.

Water Storage

A brick storage reservoir was originally built on the water-works ground and lined with concrete, but has been replaced by a new concrete reservoir on the water-works property. The old reservoir was 70 feet in diameter and carried a 20-foot depth of water. The new filtered water reservoir is in duplicate with a center wall permitting the water to flow through one half of the basin or the entire length. It measures 185 x 94 feet and has inflow and outflow pipes for each side and a connection with a gate-valve between the two sections. The water is 12½ feet deep in this basin.

The only elevated storage in the city, which is generally level, is a 144-foot standpipe 15 feet in diameter which carries 195,000 gallons. It was built 42 years ago, and a number of years ago a 20-foot additional height was built on the top.

Pumping Equipment

The steam pumping station is equipped with two 80-hp Scotch marine type boilers. There are two Snow reciprocating compound steam pumps with a water end 18 inches in diameter and with a 16-inch stroke. One of the pumps is a piston pump and the other a plunger pump. These pumps maintain 60 pounds pressure in the system by pumping continuously to the standpipe. The pressure is boosted to 75 pounds in time of fire, although this is not necessary except in times of bad fires, since the city is well-equipped with motor pumpers.

Chlorination

The water is chlorinated by a W & T semi-automatic solution feed machine with Mathieson liquid chlorine as the water leaves the settling basin for the filters. From 5 to 6 pounds of chlorine are applied daily.

No bacteriological work is done at the plant, for the State Department of Health has a local laboratory which performs all the chemical and bacteriological work necessary. The alkalinity of the water is 80 ppm, and the iron of the raw water 9 ppm, which is reduced to 0.2 in the filtered water. The water is high in manganese, running to 0.6 ppm. The carbon dioxide in the raw water is 25 ppm. and in the filtered water 8 ppm.

The well system and filtration plant are run by four men, the Superintendent of Filtration, a day fireman and a helper, and a night fireman. The city has 3,900 services, and the distribution system consists of 12- down to 6-inch cast iron pipe. There is a small amount of 2- and 4-inch pipe on the edge of town, but those sizes are no longer installed and are being replaced as rapidly as possible.

The meter rates are 22½ cents per thousand gallons, with a minimum bill of $2.25 per quarter, for which the consumer is entitled to 10,000 gallons. A cut of 25 per cent in rates was made January 1, 1932.

The Selma water works are owned by the city of Selma and are run by a Commission, with Robert Coleman as Manager and W. C. Robinson as Superintendent of Filtration.

Low-Cost Road Construction with Asphalt Emulsions

By J. A. SHAW

Asphalt Division,
Shell Eastern Petroleum Products, Inc.

THE fact that asphalt plays such an important part in the road-building program of today and the future is perhaps the reason why so much time and money have been spent by the major producers of this material in developing a more modern and simple method for its application.

Asphalt, as we all know, is used for its excellent binding qualities and for the purpose of holding in place the aggregate or metal which is to take the wear and tear of traffic. Generally, there are three recognized ways in which an asphalt binder may be prepared for application —first, by heat, second, by the use of a solvent, namely a cut-back, and, third, by emulsification of asphalt with water.

In the construction of a pavement, either of heavy-duty macadam or a light surfacing type, first consideration should be given to the quality of the asphalt base, and next to the method by which this asphalt shall be applied. By using emulsified asphalt, which is always applied cold, there is assurance of a uniform material which has not been distorted by admixture of deleterious materials or chance overheating, and it also minimizes the dangers to workmen.

Advantages of Asphalt Emulsion

As emulsions are not substitutes for asphalt, but an asphalt in a convenient form for handling, there should be no hesitancy or fear on the part of highway officials in readily accepting these products for any or all of their construction work where asphalts in other forms are being considered. The principal advantages of the asphalt emulsion can be summarized as follows:

1. An emulsion saves the cost and inconvenience of heating, eliminates the dangers of overheating, and makes possible application by inexpensive equipment.

2. Its high penetrating quality permits a high percentage of aggregate without affecting the proper coating with asphalt.

3. Its high penetrating quality enables the asphalt to infiltrate to the very bottom of the course.

4. Used cold, it is of practically the same temperature as the aggregate to which it is applied; hence, there will be no sudden congealing to affect its infiltration.

5. It may properly be used on moist or wet aggregate, eliminating many wet-weather delays.

6. The likelihood of excess asphalt or fat spots is minimized. Thoroughly non-skid surfaces are characteristics of emulsion construction.

7. It permits the use of a wide variety of aggregates, stone, gravel, slag, etc., that would not always be suitable for handling by penetration methods.

8. In light surface dressing work it sets quickly, so that there is no throwing or spattering upon cars using the surface immediately upon completion.

Inexpensive Construction

Notable success in low-cost construction has been achieved with emulsions. Stone, gravel or slag is suitable for the top over any proper base. In salvaging old gravel roads the gravel road or base is first trued up, and the crown reduced, if necessary, in the usual way with scarifier, blades, etc. Metal is added if desired, and the road is permitted to harden under traffic for a day or two. Such bases may be brought to a state of nearly perfect smoothness, making it comparatively simple to secure smooth-finished surfaces.

After the base has been thus prepared, crushed stone ranging from ¾ to 1¼-inch is uniformly spread by mechanical spreaders to a depth of about one stone thickness or slightly more. If this spreading is judiciously handled over a carefully prepared base, remarkable smoothness will result. The spread stone is lightly rolled and the emulsion is applied at the rate of 0.7-gallon per square yard. This is followed at once with ½-inch size keystone chips and again lightly rolled. A seal coat of 0.3-gallon emulsion is covered with ½-inch chips and the whole surface well rolled. About 100 pounds of stone per square yard and 1.0 gallon of emulsion are required. There is a minimum of equipment used in this work. An 8- or 10-ton roller, one, or preferably two, chip spreaders, and the tank distributor, are all that are required. From a half-mile to a mile of road may be completely transformed from a gravel road to finished hard surface per day, depending usually upon the supply of stone. When the daily length reaches one mile, it may be necessary to use two rollers. Two chip spreaders are an economy for fast work, one being used for each size of stone. No blading of this work is necessary, and probably none should be attempted. Careful handling of the stone will

A TYPICAL STATE HIGHWAY IN VIRGINIA
BUILT WITH ASPHALT EMULSION

insure as true a surface as a blade, while to use a blade on this thin depth of stone on a comparatively soft base may result in pulling dirt up into the stone. The stone should be freshly spread from storage bins or stock piles, not windrowed along the road or left over night or longer for traffic to dirty it.

Priming is not thought to be essential for this type of work, provided the base may be made reasonably hard and clean. However, priming may be necessary and desirable under other conditions. Slag or screened gravel may be substituted for stone with good results. With gravel, and perhaps with slag where voids are closed up quite tight, it may be desirable to spray the stone lightly with water just prior to the first pour of emulsion, to assist in the penetration of the emulsion. With a reasonable quantity of water, the emulsion may be applied immediately afterwards. Variations of the foregoing in respect to thickness of wearing course are possible, provided the essential relations are observed.

Penetration Macadam

In the heavier work of penetration macadam of 2 to 3 inches compacted depth or more if desirable, excellent results are also secured. These pavements are dense, waterproof and non-skid, with their films of asphalt uniformly to the bottom of the course, as has always been desired but seldom realized. Stone sizes for the body of the penetration course range from ⅝ to 2½ inches. A mixture of such sizes may be used, provided segregation in handling is avoided, or the several sizes may be separated and re-combined. Either will give satisfactory results, provided uniformity of distribution is secured, and provided the larger voids are filled with smaller size stone. One excellent method which utilizes the whole granular product of the crusher and gives a well filled pavement is as follows:

The foundation is suitably prepared. In case it consists of broken stone, gravel, etc., a thin layer ¼ to ½-inch of sand or stone dust is spread over it. This may perhaps be automatically furnished as excess filler on a new stone bottom course, or may be secured through light scarifying, or may be spread by hand. Its purpose is to prevent emulsion from running off the base, as it might were there no "stopper" provided. If the base to be covered is an old bituminous macadam concrete, brick or other hard, clean surface, the best procedure is to apply a ¼-gallon prime coat covered with ½-inch chips. This affords a good bond to the old surface, and the chips function as the reservoir to hold any excess emulsion that may come down to them from above.

The next step is the spreading one stone deep of ¾ to 1¼-inch size stone. This is followed by stone 1¼ to 2½-inch size to such depth as to give the desired depth after compaction. This is thoroughly rolled and should at this stage be tested for smoothness with a straightedge. Corrections may be effectively made at this time, whereas they are less easily accomplished later. Stone chips ¼ to ¾-inch are then lightly scattered over the surface and broomed about to fill the voids in the coarse stone. Emulsion is then applied at the rate of 0.8 to 1.0 gallon per square yard, lightly covered with chips and rolled once or twice, and broomed with a drag broom to secure uniformity. After the emulsion has set, a second pour of 1.0 to 1.2 gallons is made, well covered and rolled and broomed as before. After 24 hours have elapsed, the surface should be thoroughly rolled, with the brooming continued, and after one to seven days under traffic excess chips should be removed and a seal coat of 0.6-gallon applied, covered lightly, thoroughly rolled and broomed. The pavement is then ready for traffic.

It may be desired to use crusher-stone between the sizes ¾ and 2½-inch. This is practicable, and will give good results, provided, as above stated, the surface is carefully scattered with chips wherever large voids show. Within reason, any size stone up to, say, 4 inches, may be used for such work, provided the voids are properly closed before the first pour of emulsion.

A suggestion regarding prime coats on hard pavements is that great care be taken in cleaning the old surface. Stone dust is especially likely to prevent proper adhesion of the prime. For that reason, it is advisable to carry the priming well ahead of other work, and to prime full width even though the heavier surfacing be done by half widths.

Retread and Road Mix

For retread or road mix work, a more stable emulsion is used than for penetration or surface dressing work; that is, the emulsion is more resistant to depositing its asphalt. This is necessary if it is to withstand the more violent agitation of mixing. Also, the degree of stability necessary may vary with the presence or absence of fines in the aggregate being worked. The process of manipulation follows the usual practice with other binders except in details. Emulsions generally cure completely in a day or less, and the procedure is governed accordingly.

ACKNOWLEDGMENT.—From a paper presented before the Rhode Island Highway Association.

Civic Radio Education in Virginia

THE League of Virginia Municipalities is conducting a series of radio talks on current municipal problems of interest to officials and citizens alike. It is given over Station WRVA, Richmond, at 8:15 P. M. every Tuesday, and began February 21. Subjects and speakers for March are:

7, Cooperating Cities and Towns, Morton L. Wallerstein, Executive Secretary, League of Virginia Municipalities.

14, The Council's Responsibility for Good Government, Mayor R. W. West, Newport News.

21, Providing for the Unfortunate in a Modern Way, Dr. H. G. Parker, Assistant Director of Public Welfare, Norfolk.

28, Planning and Zoning, Col. R. Keith Compton, Director of Public Works, Richmond.

$4,000 for Leakage Survey Saves $500,000 in Water

By A. R. O'REILLY
Chief Engineer,
Bureau of Water,
Reading, Pa.

ALL improvements which can "pay their way" should be made in pumping equipment and operation, water purification, accounting and administration, but after that has been accomplished there still remains a broad and fertile field for saving in the average waterworks system. After all possible allowance has been made for water used by domestic, commercial and industrial consumers and for the various public uses, a wide margin remains between the amount of water actually used for these purposes and the amount put into the underground piping. I do not refer to the careless or extravagant use of water, which can be detected and controlled, but to leakage, which serves no useful purpose and which may lead to serious damage to paving and underground structures.

In Reading our conditions were rather worse than the average, in that the distribution system is by no means new, the city having purchased the nucleus of the system from a private water company in 1865. On the other hand, our number of consumers and the consumption per mile of main are higher than in communities less densely populated. At present we have three gravity supplies and one pumped supply, the latter furnishing approximately 70 per cent of the total quantity furnished. Our distribution system includes 160 miles of pipe, ranging in size from 6 inches to 36 inches, 5,000 gate-valves and 1,600 fire hydrants. The entire supply to the city is metered and all sales are metered. Various institutional consumers which receive free water are also 100 per cent metered. At the end of 1931 there were 26,584 service meters in use.

Records of every part of the system are very complete. Among the more important records maintained are the following:

Readings on each supply and at each reservoir and standpipe are taken every twelve hours.

Reading of customers' meters are taken every month on meters of one inch and over, and every three months on meters smaller than one inch.

Complete maintenance records are kept of all meters, valves and fire hydrants.

Drawings on a scale of 60 feet to the inch form a complete atlas of the pipe system, with detail drawings on a large scale of all special work.

Pocket maps are made up for field work, showing all pipe and fire hydrants and also the location, make, size and operation of all valves.

Code numbers are used to designate valves, fire hydrants and meters.

Distinctive colors are used on fire hydrants to indicate pressures: red for pressures above 100 pounds; aluminum for pressures from 50 pounds to 100 pounds; yellow for pressures below 50 pounds; and separate hydrants are maintained for street flushing and are painted blue.

Water meters one inch and over in diameter are tested in place yearly, and registration is kept accurate within 3 per cent; meters less than one inch in diameter are removed for test every five years, at which time they are thoroughly inspected, tested and repaired.

We make a continuous survey of all gate-valves, the equipment consisting of a truck equipped with machinery of our own design for mechanically operating the valves.

Following-up the Pitometer Survey

In 1918 a comprehensive pitometer survey was made of the city's distribution system, showing a leakage of approximately 4¾ million gallons daily. Most of the major leaks were repaired at that time, but the leakage very soon became as great or greater, owing to the lack of a continuous follow-up procedure. At that time the system was only partially metered, and repairs were made only when they forced themselves on the Bureau's attention.

By 1926 the entire system was metered and the average water accounted for was only 9.54 million gallons daily out of a total of 18.4 million gallons supplied to the city. In other words, the unaccounted-for water averaged 8.86 million gallons daily, or more than 48 per cent of the total. The maximum daily consumption that year was 23.363 million gallons, which threw an excessive load on our purification plants. An extensive four-year program for extending and improving our main source of supply (Maiden Creek), estimated to cost $4,282,000, had been started in January of that year, and active steps were taken to reduce the amount of lost water.

A continuous leakage survey of all distribution mains and supply lines was established in 1927, with adequate follow-up in the way of repairs. This survey has been continued ever since with very satisfactory results. The survey is made by two leak patrolmen, who cover the 160 miles of piping every three weeks. As a result, major leaks cannot go undetected longer than three weeks. The equipment used by these men is extremely simple, consisting of a metal rod and an earphone.

Procedure for the Continuous Survey

In the distribution system the patrolman places the rod on the stem of each gate-valve, of which there are approximately 5,000 in service. Each of these valves is housed in a vault of our own design which permits access to the valve without disturbing the street surface. After the amplifier is placed on the end of the rod, the resultant sound indicates whether there is a leak in the vicinity. A similar test is made by placing the rod with the amplifier on the stem of each fire hydrant, of which there are approximately 1,600 in service. This method has resulted in detecting leaks on a ½-inch service within a radius of one city block.

This survey is supplemented by requiring each meter reader to check-up on the consumer's services when reading the meters, with the result that all services are checked at least every three months, and services of one inch and over are checked every month.

The accompanying tables show the results secured by our leakage survey and the cost of securing those results.

It must be remembered that the unaccounted-for water in 1931, amounting to 2.82 million gallons daily, includes unmetered public uses, such as street flushing, fire fighting, etc. Assuming the entire 2.82 million gallons to represent leakage and ignoring the many miles of service pipes, this would correspond to a leakage of 1,593 gallons daily per mile per inch diameter. The 1926 figure of 8.86 million gallons daily, prorated on the pipe then in use, amounted to 5,643 gallons daily per mile per inch diameter.

The survey in 1932 showed a slight reduction in leakage compared with 1931. It would seem, however, that with an annual expenditure of $7,000 to $7,500 we can retain the gain already made, whereas if a reduction of $4,000 were made in this annual expenditure, leakage conditions would revert in a very few years to those of 1926. If this be so, an annual patrol cost of $4,000 saves the city water worth $500,000 a year at the present sales price, besides materially postponing the time when major extensions of the system must be made. Reduced flow in the mains results in less friction loss, resulting in higher pressures for the same useful flow, or in greater useful flow for the same loss in pressure.

ACKNOWLEDGMENT.—From a paper presented before the Fifth Annual Conference, Pennsylvania Water Works Operators Association.

TABLE 1

Results of Leakage Survey, with Indicated Savings
(Quantity of water is daily average in mgd)

Year	Demand	Sales	Free Water	Unaccounted-for	Previous Year	Reductions from 1926
1926.....	18.4	9.18	0.36	8.86	...	...
1927.....	16.1	8.70	0.33	7.07	1.79	1.79
1928.....	14.2	8.60	0.40	5.20	1.87	3.66
1929.....	13.1	8.86	0.52	3.72	1.48	5.14
1930.....	12.2	8.55	0.58	3.07	.65	5.79
1931.....	11.5	8.04	0.64	2.82	.25	6.04

TABLE 2

Value of Water Saved Compared with 1926, based on Average Selling Price of Water

1927—1.79 mgd @ $223.39— $399.87 per day.....	$145,953	per year
1928—3.66 mgd @ $227.80— $833.75 per day.....	305,152	" "
1929—5.14 mgd @ $226.91—$1,166.33 per day.....	425,718	" "
1930—5.79 mgd @ $231.19—$1,338.59 per day.....	488,585	" "
1931—6.04 mgd @ $234.11—$1,414.02 per day.....	516,117	" "
Total saving in 5 years.....	$1,881,525	

TABLE 3

Cost of Leakage Survey and Repairs

Year	Number of Leaks	Patrol	Repairs	Total
1926.....	119	.....	$3,983.25	$3,983.25
1927.....	299	$3,345.82	9,129.71	12,475.53
1928.....	128	5,721.66	3,719.55	9,441.21
1929.....	138	4,925.58	5,806.20	10,731.78
1930.....	87	3,657.72	4,549.68	8,207.40
1931.....	61	4,160.55	3,169.56	7,330.11
	832	$21,811.33	$30,357.95	$52,169.28

For the 5-year period the average cost per leak, $62.71, made up of $26.22 for patrol, $36.49 for repair.

Doing as the Romans Did When They Built Swimming Pools

By **W. S. POLLARD**
Mechanical Engineer, Philadelphia, Pa.

TWENTY-TWO hundred years ago Appius Claudius became Censor of the Roman Republic. To increase the opportunities for healthful public bathing and swimming, he built an aqueduct from the springs at Praeneste, a score of miles away, to the new public bath and swimming pool outside the walls of Rome; and a boiling plant to soften the hard spring water for cleansing purposes. Such throngs of people came for warm baths and to swim in the cold, hard water of the pool that not all could enter. The experiment had proved a success, and more and more baths and swimming pools were built, in the parks inside the walls of Rome, with additional aqueducts, until the daily consumption of water for bathing and swimming is said to have reached nearly 200,000,000 gallons, and for the benefit of the people the Romans operated public baths and swimming pools for a period of 700 years.

Upon what did the success depend? First, upon the design of the pool and the circulation of the water, its great quantity and its coolness; second, upon the strict enforcement of the laws made by the Censor for the operation of the baths and pools. Attendants found guilty of neglecting their duty received a punishment equal to that for manslaughter.

The water which came from the aqueduct entered the pool bottom through numerous inlets and overflowed at the surface into a gutter around the pool. Thus the possibility of short-circuiting the water from inlet to outlet was eliminated, stagnation was prevented, and the objectionable matter on the surface of the water was removed.

In the year 453 the Huns, with whom the Romans were at war, cut the aqueducts that supplied the water, and fifty years later many of the great bathing and swimming pools were in ruins. After the fall of the Roman Empire, the laws that governed bathing and swimming pools in other countries that had adopted the Roman system grew weaker and weaker. Design and operation were changed extensively to economize on water. During the Middle Ages bathing and swimming were cultivated very little, the pools degenerated and became places of infection, epidemics broke out, and finally all the pools were closed.

In the nineteenth century the healthful effect of bathing and swimming once more became recognized, but the early development of pools proceeded with practically no knowledge of the laws that govern the action of polluting material in water. Pools were built in gymnasiums, clubs, hotels, etc., where bathing loads were very light and the polluting of the water was hardly noticeable. Experience collected from these pools with light bathing loads has been used to establish the present method of purifying the water in nearly all pools.

When the bathing load is heavy, a large quantity of polluted material is brought into the pool. The surface water is considered the most dangerous, for much of the polluting material collects on the surface shortly after it has been deposited by the bathers, and is allowed to remain there and decompose, forming a scum; the water being of a suitable temperature, the surface of the pool becomes a bacteria incubator.

In modified form, some of the best designed modern pools use the Roman method of circulating the water, thus removing much of the polluted material from the pool shortly after it has been deposited by the bather. A standard purification plant capable of keeping the bacteria count safe at peak load should be in service, operating at a 2-gallon rate per square foot per minute, which experience has proved to be economical and to give excellent results. The value of liquid chlorine as a sterilizer for swimming pool water has become generally recognized. It requires considerable mixing with the water in all parts of the pool, and this mixing is provided by the under-floor method of circulation. Thus chlorine treatment is an added safeguard.

Resurfacing Brick with Brick—An Economical Practice

By MORGAN P. O'BRIEN
City Engineer, Springfield, Ill.

THERE are certain fundamental requirements which should be answered by any first-class paving project, and among these may be mentioned first the capacity to carry the loading that may properly be expected, and a surface that will not deteriorate under such traffic. The question of economical methods and materials is, of course, of prime importance, and in this study not only first cost but maintenance expense through the expected life of the project must be given consideration.

In the Central West nearly all the early high-type pavements were built using brick as a wearing surface, and in many cases a layer of brick laid flat on a bed of sand or gravel spread on the subgrade was used as a foundation. Later, concrete was used for this purpose.

The city of Springfield, Ill., is situated in the central part of the state, and is a large coal-producing center. A bed of shale, ideal for brick manufacturing purposes, underlies the city, and soon after the introduction of brick pavements the manufacture of paving brick as a major industry was instituted. Since that time, about 1888, the greater part of Springfield streets has been paved with this material, starting with the small pavers set on edge, and using both the two-course and the concrete base type of construction.

The Older Pavements

Naturally, and in the course of time, the pavements twenty-five or more years old, which have been subjected to horse-drawn, steel-tired traffic, have become worn and rough. This has come about either by the impact and attrition of traffic, by improper replacement following cuts for service pipes, or from any of a number of other causes.

There have been few, if any, complete failures, or even partial failures of any appreciable area. In other words, the early brick pavements have remained stable and capable of carrying modern traffic, but have lost one of the features required in an efficient street pavement: viz., smoothness.

These old streets, while uncomfortable to riders and expensive to vehicles, still have a very important value. They have every feature that a new pavement has, except smoothness. The subgrade, having been subjected to many years of traffic, has been compacted to an extent almost impossible of attainment in new construction. The action of frost has tended, undoubtedly, to loosen the surface of the subgrade to the extent that capillarity is broken and the consequent heaving due to frozen moisture is minimized. In the years of heavy service to which they have been subjected, areas of weakness or partial failure are clearly indicated, and usually are easily remedied. In other words, the problem of restoring smoothness and making permanent repairs is clearly indicated, and its solution, as to both method and cost, may be reached by an intelligent study and application of well-known principles of construction.

Resurfacing Undertaken

Seventh Street, leading from the downtown business district through a high-class residential section to the industrial area southeast of the city, was one of the first streets chosen for resurfacing, and an intensive investigation of the old pavement was made. This pavement, 30 feet wide, was laid in sections at various times, beginning in 1890. The first section was of the two-course type, and later projects employed a concrete base. There were numerous indications of improperly filled excavations, and of shifting of sand cushion due, undoubtedly, to penetration of moisture and consequent movement of brick through impact. The entire surface was built of small hard-burned brick set on edge, and a sand filler was used throughout. At all places where service cuts showed a settlement of surface the brick were removed, and reinforced concrete slabs with a bearing of one foot beyond the cut on all sides were installed. These slabs extended to the top of the wearing surface. The same method was used on new cuts made immediately prior to reconstruction. It was decided to widen the pavement to 38 feet, and the widening was accomplished by the use of concrete gutter flags four feet wide on each side, with integral concrete curbs. Estimates of cost were prepared contemplating the use of sheet asphalt and of vitrified brick, and each method showed the expense to be almost identical. The Board of Local Improvements adopted brick.

In preparing plans for resurfacing with brick there were

THE MASTIC CUSHION ROLLED AND READY FOR THE BRICK

ROLLING BRICK AND APPLYING THE ASPHALT JOINT FILLER WITH A SQUEEGEE

few available data, particularly in regard to a practicable method of preparing the old surface for the new one. The writer is a firm believer in having a uniform thickness of cushion as well as a minimum thickness, and observation of different resurfacing projects where sand of varying depths was used on old brick or old foundations indicated the necessity of another method of leveling. Millions of square yards of worn brick pavements have been salvaged by the use of bituminous materials, and it was felt that the application of methods used in this type of resurfacing would work very nicely with a new brick surface. Accordingly, the old pavement, after repairs outlined above were made, was flushed and swept, so that all dirt was removed, and the sand filler was removed about one-quarter of an inch below the surface of the brick. The concrete gutters were laid to a proper grade, and extended a minimum of 3½ inches above the surface of the brick at the old gutter line, to provide for a 1-inch cushion and a 2½-inch brick. The old stone curbs had previously been removed by sledging-off that part extending above the brick surface. Grades were established at the center line, and a portland cement mortar, consisting of one part cement and three parts sand, was spread over the surface of the brick. Where a fill of more than 1 inch was needed, a concrete, using the same mortar and a coarse aggregate from ¾-inch to ¼-inch, was used. The mortar and concrete were struck off by templates to the proper cross-section and grade, and were finished to a true, level surface by hand methods. As soon as the water sheen had left, an emulsified asphalt was sprayed on the surface as a curing agent. In over 15,000 square yards in the Seventh Street project there was but one surface check observed, and there was absolutely no breaking-up of the mortar surface under trucks hauling in the cushion material. To bring the old surface to a true grade required 144 cubic yards of concrete and 317 cubic yards of mortar, or an average of 0.0308-cubic yard of filling material per square yard of surface. The labor cost of spreading and finishing was approximately 3 cents per square yard.

A mastic cushion one inch thick, using 5 per cent of cut-back asphalt, was laid and struck off parallel to the base. This was thoroughly rolled by hand, and brought to a true grade by hand lutes. The sand was heated to about 200 degrees in an asphalt plant, and the asphalt was incorporated in a pugmill. A more expensive, and probably less efficient, method is by using a heater in a concrete mixer.

Brick were filled with an asphalt filler, and a top dressing of sand was applied and rolled. The surface was tested with a straightedge, and no variation of more than ¼-inch in 10 feet was allowed.

On other and smaller jobs, a small aggregate asphaltic concrete leveling course was used, and equally satisfactory results were obtained.

An Economical Practice

All the brick resurfacing constructed during the past year has met the entire approval of property owners and public officials, and the cost has been a fraction of what it would have been in case the pavements had been entirely rebuilt. There is no difference in appearance between the resurfaced streets and the newly constructed ones, and there is no reason to believe that, with an equal volume of traffic, the resurfacing will fail to give equal service.

The economy and feasibility of conserving the investment carried in pavement by means of practical resurfacing methods have been thoroughly demonstrated to the people of Springfield. They are convinced of the waste occasioned by destroying a valuable asset, and, while there was much doubt felt and expressed previous to the execution of the work, the city officials have often been congratulated since on the success of the projects. A feature that appeals particularly to residents and to those engaged in business is the short time traffic is excluded from the street under construction. It is seldom necessary to entirely close a street for more than two blocks, and then for not more than two or three days. This, to a business concern, is a saving, over the delay occasioned by new construction, of an amount easily equal to the cost of the work, and in a residential district will minimize complaints from those who, under other circumstances, are unable to reach their homes with vehicles for weeks at a time.

ACKNOWLEDGMENT.—From a paper presented before the National Paving Brick Association.

Motorists Pay 24.4 Per Cent of Value of Vehicles Annually in Taxes

ACCORDING to a report of the National Taxation Committee of the American Automobile Association an all-time high for taxation of motor vehicles was reached in 1932 with an average tax of $45.28 per vehicle. On a total valuation of $4,505,625,600, motor-vehicle property paid $1,099,293,844 in Federal, state and local taxes, amounting to a levy of 24.4 per cent per year on the value. At this rate the average motor vehicle during its life period of seven years pays taxes in the amount of 170.8 per cent of its average value. This tremendous taxation is bound to accelerate the decline in registration and use of motor vehicles unless steps are taken to put motor taxes on a reasonable level, to limit the types of agencies levying them and to safeguard every cent of revenue from these taxes for road purposes.

A Traveling Exhibit of Housing Projects

A TRAVELING exhibit illustrating two contrasting methods of housing—speculative building and large-scale development—in the United States and Europe, has been made available by the Special Committee on Housing of the American Institute of Architects' Committee on the Economics of Site Planning and Housing.* The exhibit is being shown at the Architectural League Exhibition in New York City until March 12, after which time it will be sent to cities interested in displaying as a unit the 25 panels of plans and photographs. Only the costs of transportation, boxing and insurance will be charged to the cities exhibiting.

The panels are uniform and show photographs or architects' drawings, layout plans, sections, dwelling plans and coverage diagrams drawn up at the same scale. Uniform information on size, costs, rents, etc., is also given. The United States is represented by projects in Cleveland, Detroit, Philadelphia, Newark and New York City, some constructed and some still on paper. In each case an air photograph shows the conditions which the project is designed to remedy. The eight European charts illustrate what has been done since the war in England, Germany, Holland, France, Switzerland, Russia and Austria to create low-rental dwellings. Contrasting photographs illustrate pre-war conditions and methods of construction.

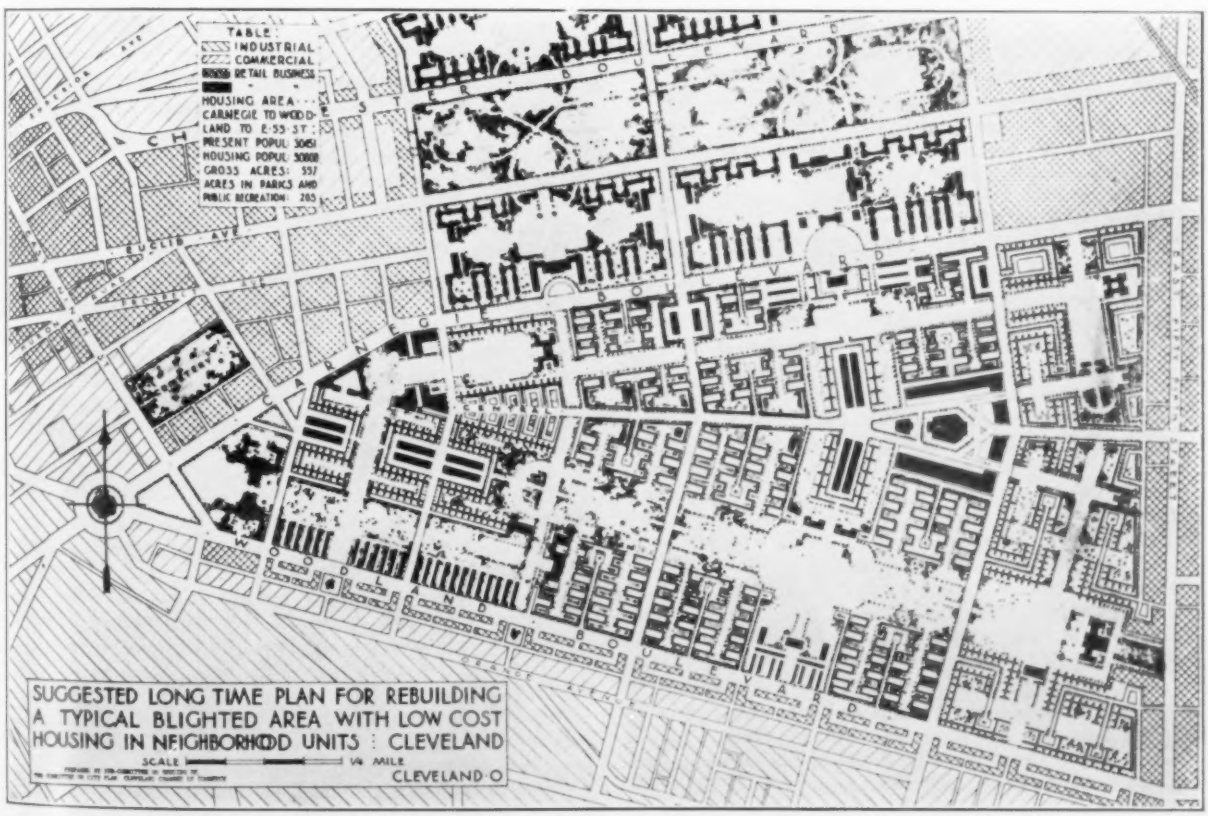
The following excerpts from a statement by the Committee on Housing Exhibition (Clarence S. Stein, Chairman; Catherine K. Bauer, Secretary) of the Architectural League of New York, are of special interest in this connection:

"Our failure to improve the great mass of housing during the last generation is due to the fact that we have brought to the new situation in housing an antiquated set of methods, habits, and ideals. We have continued to think of the dwelling house as a free and independent unit like the old-fashioned farmhouse or the suburban cottage of the eighties: a unit to be designed by itself, to be financed by itself, to be built by itself, to have for itself sufficient land to take care of every need for sunlight and recreation. Meanwhile, the new utilities and conveniences of urban living have destroyed this kind of isolation and self-sufficiency; and the houses we build have all the disadvantages of an obsolete form and layout and none of the positive virtues of our new mode of community organization.

The House and the Community

"The modern dwelling house is a unit in a neighborhood community. To design a house that will accommodate all the needs of modern living, one must also design the community.

* Inquiries should be addressed to Robert D. Kohn, 56 West 45th Street, New York.



ONE OF THE TWO PROPOSALS FOR SLUM REHABILITATION IN CLEVELAND INCLUDED IN THE TRAVELING EXHIBIT

To build such a community effectively and cheaply, one must do it, where possible, in a single operation from the purchase of the raw land to the final plan and construction of its shops, schools, playgrounds, and other communal facilities. . . .

"Both American and European experiments have demonstrated that to increase the cheapness, efficiency, and comeliness of the house, one cannot isolate any single element and hope to solve the problem. Standardized parts and mechanized processes of production are necessary elements, for example, in modern housing; and in Europe they have now reached the plane of positive esthetic expression in the new functionalist architecture. But a close analysis of the costs of housing proves conclusively that the manufactured house does not *by itself* promise any large-scale improvement in our living quarters. Indeed, the economies in the use of land and utilities offered by large-scale group housing counterbalance such economies of mass-production as are promised in the units designed for individual construction. When one considers the other essentials of good housing, sunlight, air, gardens, play space, recreation facilities, streets isolated from noisy through-traffic, access to parks or open country, it is plain that only a united and comprehensive attack upon the entire problem of housing offers a path of genuine advance. A motor car is inefficient without suitable roads; a house is inefficient and incomplete without a suitable communal environment. To forget this fact does not in the end lower the costs of the house: it merely helps to deteriorate the neighborhood and creates the economic burden and waste of the blighted area. The environment is a primary cost of housing, and the design of it cannot be treated as an afterthought. . . .

"With a two-year cessation of building, we shall presently be faced with a serious housing shortage, since population has continued to increase and the usual proportion of antiquated houses has become unlivable. While this threatening crisis has been obscured for the moment by the drift to the country and by the doubling-up of families that has taken place under the stress of poverty and unemployment, with any return to normal production levels there will be a shaking-out of the population once more into its normal living quarters. When this happens, the demand will outrun the supply.

"There are two reasons for anticipating this need immediately. One is that as soon as we are faced with a shortage, we shall attempt to relieve the strain in the quickest way, not in the best way: this would mean adding miles of substandard housing to the terrible mess we made after the shortage of 1919. But the other reason is equally important; namely, if we go in now for large-scale housing, with its secure market and its stable investment, with its vast demand for both manufactured materials and labor, we shall do more to effect a return to normal production levels than by any other means that have been suggested. . . . We need money for this new housing; and we need effective standards for house design and community design. To supply the money without laying down the standards would not merely be to miss an opportunity for improving living conditions, but to sanction a reckless waste."

Why Continue in the Covered-Wagon Era of Construction?

The Folly of Assuming That Our Cities Are Over-Built

"OVER-BUILT with what, and for whom?" asked Virgil Jordan, President of the National Industrial Conference Board, in a challenging answer, at the New York Building Congress on February 16, "to those who have surrendered to the prevalent spirit of defeatism and despair about the possibilities of progress and who assure us that we have expanded too fast and that the country is 'overbuilt'."

"Any one," continued Dr. Jordan, "who has seen anything of the United States outside a few sections of its larger cities and has looked with a candid eye at the conditions under which its people live and work today, must ask himself when, if ever, this country was built at all? In truth, almost everything we have in the United States today in the way of construction services—homes, office buildings, factories, whole towns, compared with what we are quite capable of creating, is a mass of rotting rubbish. The American people are still living in the covered-wagon stage of construction, a pioneer people squatting in a series of frontier mining camps as though they were going to move on tomorrow. A few thousand miles of surfaced roads built in the past few years, fringed with filling stations and hot-dog stands, stretch between these squalid camps through endless miles of wilderness and desolation like faint streamers from a higher standard of civilized living sent out from a few great cities. We have still to build an America worthy of the enterprise and aspirations of our people, and we may be sure that when we do we shall have to build it again and again because everything we build for one generation will be obsolete for the next. Certainly almost everything that has been done so far, impressive or extravagant as it may seem to us in the pinchbeck spirit that prevails today, is obsolete and inadequate for the needs and aspirations of tomorrow.

"Neither in the building industry nor in any other aspect of our economic development has there really been anything done with this country as yet. In relation to its needs and possibilities it remains today, as truly as it did a century ago, an unexplored and unexploited continent. In the construction field, as in almost every other, there is no greater delusion than that of overproduction. . . .

"One may go further and say fairly that there can be no such thing as the overproduction of anything for the world as a whole because the need and desire for all the things that men can produce has never been satisfied since the world began. Our difficulties do not lie in our excessive capacity to produce goods and services; they lie in our inability to exchange, distribute, and consume them, and the cause of these difficulties lies quite outside the control of our productive industries. The services provided by the construction industries are no exception, but rather the most conspicuous and crucial example. In this field, even more than in any other, the idea of overproduction is not merely a myth; it is a superstition which might be expected only of a benighted, ignorant and stupid primitive people. . . .

"We need not depend upon any mysterious and as yet unknown new inventions to create new demand and develop wholly new industries, nor need we look for international factors to create consumers beyond the seas. We have the consumers right here at home ardently eager to enjoy the services which the construction industry—oldest of them all, yet everlastingly new and changing—is ready and able to provide as soon as the curse which our archaic currency and credit system and antediluvian economic ideas about standards of life have laid upon American initiative and enterprise is removed."

Portland Tax Body Speaks for Official City Plan as a Measure of Economy

By HARRY D. FREEMAN*

THE minds of the nation are now directed to fundamentals, as well as to expedients, in solving financial problems of our cities. A case in point is found in the eleventh annual report of the Tax Supervising and Conservation Commission of Multnomah County, Oregon. In a period given to viewing with alarm, the official adoption of the recently prepared city plan is urged as a major element in a scheme for future financial economy. This Portland tax-studying body speaks as follows:

"It [the city plan] is so outstanding in its comprehensiveness that it even sets up the necessary legal procedure to put the plan into full operation. It should be adopted as the official plan of the city of Portland as soon as this can be brought about. . . . The immediate adoption of this plan would not only permit at once of the inauguration of much detailed work on the part of the City Planning Commission and the City Engineer's department, but, what is infinitely more desired, it would ultimately result in a saving of millions of dollars in the cost of street-widening proceedings, would stabilize real estate investments, would permit of and stabilize public building programs, would settle or avoid controversies with community clubs, other organizations and individuals, and would minimize the pressure of undue influence brought upon the City Planning Commission and the City Council in planning matters."

Portland's Street Program

Out of 42 miles of Portland streets that have been widened or extended during the last fifteen years, 75 per cent were major traffic projects and fit in with the now revised and coordinated major street plan of the city. Portland's complete street program, based upon a 50-year growth, calls for an additional 147.3 miles of widenings and 31.3 miles of extensions, a total of 178.6 miles. There are 82.7 miles of major streets having adequate width.

The scale of the Portland master plan of major streets can be easily seen by comparison with Rochester, N. Y., and Louisville, Ky., in the table at the top of the next column. These three cities have about the same population, but Portland has much more corporate area than the other two. The miles of major streets per square mile of area are about the same for all, but Portland's total mileage is correspondingly higher than that of Rochester. However, it will be seen that in spite of the large area Portland has a higher percentage of streets of sufficient width and a lower percentage of streets to be widened.

The Tax Commission, in recommending the immediate adoption of the major street plan, foresees millions of dollars in savings to Portland taxpayers. The problem is one of simple arithmetic. Industrial corporations spend huge sums in research with the hope of introducing new

TABLE SHOWING COMPARISON OF THE MAJOR STREET SYSTEM IN PORTLAND WITH THOSE OF ROCHESTER, N. Y., AND LOUISVILLE, KY.

City	Population 1930	Area of City in Sq. Mi.	Total Miles Major Streets	Miles of Major Sts. Per Sq. Mi. of Area	Major Streets of Sufficient Width: Miles	Major Streets of Sufficient Width: % Total System	Major Streets to Be Widened: Miles	Major Streets to Be Widened: % Total System	New Openings and Extensions: Miles	New Openings and Extensions: % Total System
Portland	301,815	66.7	261.3	3.9	82.7	31.6	147.3	56.4	31.3	12.0
Rochester	328,132	36.35	145.27	4.0	26.3	18.1	106.0	73.0	12.97	8.9
Louisville	307,745	40.68	144.38	3.55	39.92	27.7	94.59	65.4	9.87	6.9

and cheaper raw material, new methods of manufacture and new methods of marketing in order to cut down production cost in quantity and the selling cost of a product. Those industries which did look ahead and adopt sensible long-term programs in times of plenty remain fundamentally sound in times of panic. "Boom period overhead costs," pyramided without a weather eye to the future, cannot ride out the storm in industry or in municipal affairs in most cases. Portland is a financially sound city today, although, like most others, it is faced with acute problems significant of the times. In such position Portland turns to fundamental thinking and to long-term planning.

Great Savings at Low Cost

The city of Portland and the county of Multnomah recently expended about 7 cents per capita for research, because the demand for traffic convenience required an official street plan if the city was ever to have a complete and efficient traffic street system.

The cost of the city plan is infinitesimal when compared with savings to be realized under an official street plan. The Tax Supervising and Conservation Commission sees savings not only from official building lines on major traffic streets but also in the prorating of public expenditures over a period of years by determining programs of public improvements based upon estimated municipal income for the period.

The Commission introduces other thoughts between the lines when it speaks of the official plan as an instrument for settling and avoiding controversies with various organizations, individuals and interests in their prosecution of pet plans. As a rule, most projects are started in fair order of importance, and such has been the case in Portland, but in almost every city there can be found ill-timed public construction. Every large city is a complicated machine and its structural members must be pieced together in a definite order. The Portland tax body sees, in the future, a thought-out program with projects definitely outlined in order of importance. It does not see the public-improvement band wagon being pursued by one and all, and the inevitable juggling of various interests for a place thereon.

* Resident City Planner in Portland, Ore., for Bartholomew and Associates, City Plan and Landscape Engineers, Saint Louis, Mo.

Longmont Turns the County Fair Grounds into a Recreational Center

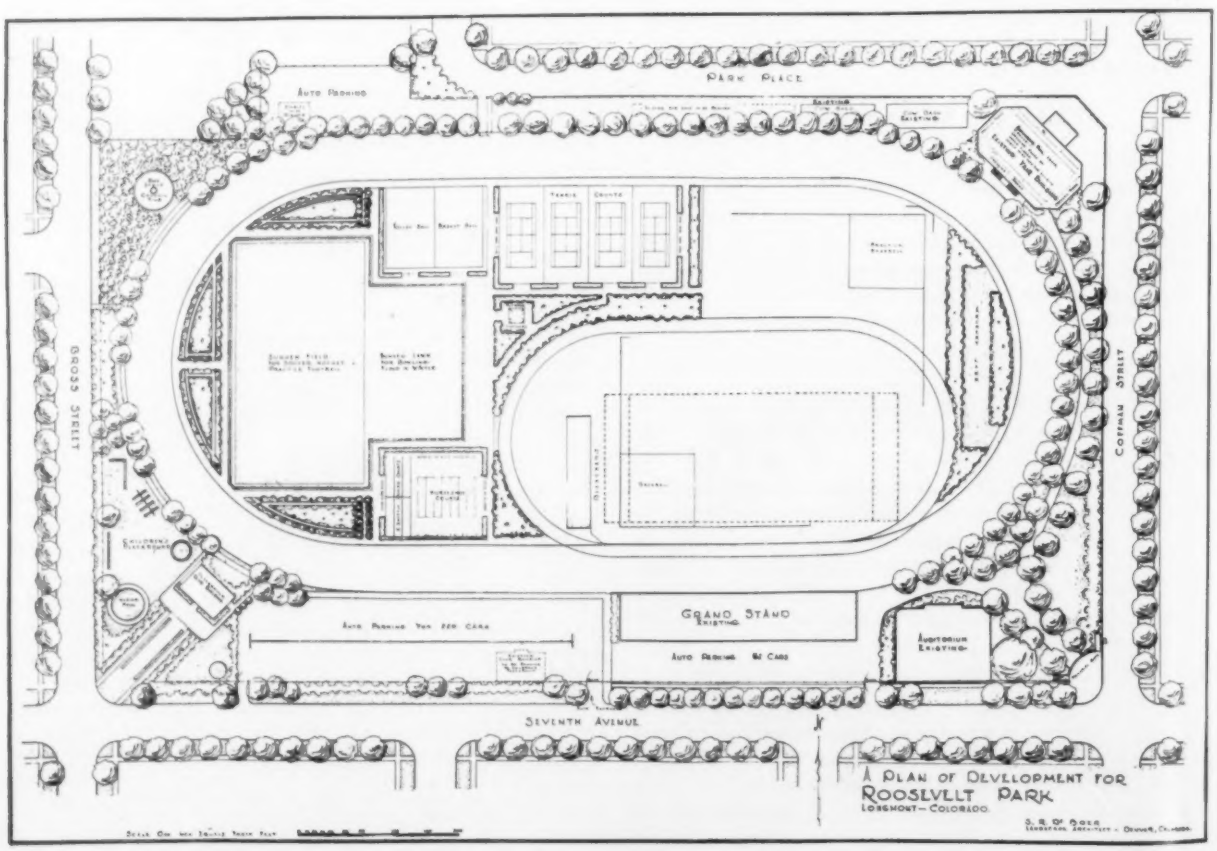
By **S. R. DeBOER**
Landscape Architect, Denver, Colo.

FOR many years the city of Longmont, Colo., staged the Boulder County Fair in Roosevelt Park. The tract is an area of about 27 acres and contains a race-track, a grandstand, a large auditorium, and several exhibition buildings. As attendance at the Fair has diminished, the City Council and the City Park Commission have decided to turn the park into a large recreational center, yet to retain the major features of its former use.

The race-track and the grandstand have been left as they were. The main ball field is laid out on the old infield directly in front of the grandstand. Removable bleachers are placed on the other side of the diamond. The present excellent football field at the High School may eventually have to be superseded because of its location on a main street; therefore, since baseball is considered the primary use of the new field, a football field has been superimposed on it for future use.

A sunken lawn is provided for soccer, field hockey and football practice games, and another lawn for bowling. This entire grassed field can be flooded in winter and part of it arranged for ice hockey. One of the four concreted tennis courts north of the running track may also be flooded for additional hockey space. A volley-ball and a basket-ball court are placed in the planting around the running track. There are horseshoe and shuffleboard courts south of the sunken lawns. A practice baseball field and an archery lawn are the remaining features of the old infield. The whole arrangement of the infield is such that there will be no obstruction to the view of future horse races, if any.

A small building now used for boys' club work will be moved to the southwest corner of the old outfield, where it will be the main feature of the existing children's playground. In another corner of the park there will be a Boy Scout Council ring with fireplace and seats in a grove of pine trees. It is proposed to place a heated swimming pool on top of the ground in a two-story Fair building, using the upstairs exhibition booths as dressing rooms. Entrance to the pool will be from stairways on the outside of the building. This will leave part of the lower floor for exhibition space separate from the pool. The very attractive auditorium will be used for important meetings in the recreational program. With plans definitely approved, the city can do the construction work step by step as finances or the need of emergency relief demands and in this way Longmont expects to be able to make the park at low cost to the taxpayers.



Protecting Water Works from Floods

By F. E. HALL

City Engineer and Superintendent,
Water and Sewer Department,
Greenville, Miss.

THE water works of Greenville, in the heart of the Mississippi Delta, was seriously affected by the floods of 1927. On the morning of April 21 at 7:30 a break occurred in the main levee on the east bank of the Mississippi River at Mounds Landing, sixteen miles north of Greenville. There naturally followed a great deal of speculation and many suggestions relative to the proper course of procedure for adequately protecting the city from the flood. The majority of our people, including those in authority, were of the opinion that strengthening the small protection levee along the northern boundary of the city would afford the most economical and efficient protection obtainable. Therefore, every available man was concentrated on this front line with sandbags. The fight had to be abandoned before midnight, with water pouring over the levee for its entire length and finally washing the inadequate sandbag barrier away within a few hours.

So great was the confidence placed in this means of protection, that a second line of defense for the protection of the water works was deemed entirely unnecessary; consequently, the entire plant with all the equipment, pumps, boilers, and wells, was inundated to a depth of six feet. Needless to say, service was interrupted, and any possibility of resuming operation in the face of the terrific currents of those turbid waters seemed very remote and impractical.

During those first days of uncertainty, of panic and an ever increasing realization of the seriousness of the situation, it was indeed difficult for any one to formulate constructive plans for resuming operation. Some one suggested the construction of a sand-bag levee around the entire water works; this would have soon proved impractical in the face of the terrific currents present, as well as exceedingly expensive.

The discovery of two small private wells situated in the central portion of the city on much higher ground, and therefore not flooded to sufficient depth to prohibit operation, saved the day. These wells were drafted into service, furnishing water to the city through a fire hose attached to a fire hydrant. This source of supply soon proved inadequate because of the haste with which residences and other buildings had been abandoned. The people in their hurry to leave had not overlooked the need of water, but had made an effort to collect small amounts prior to the interruption of service, and had left these fixtures open after water had ceased to flow. Hence gallons of water were wasted through the open fixtures and the few fire hydrants broken by the larger boats plying the city streets. This unnecessary wastage gave rise to another problem.

To supply a sufficient quantity of water, it was necessary to supplement the limited supply of the private wells. In the search for an additional source, an auxiliary well in the city system was found to be usable. The well was located on the highest available ground and was therefore easily protected from the few feet of water surrounding it, by the construction of a sand-bag levee. This was done by barging earth to the site from the main levee. This work was soon accomplished, and a small gasoline-engine-driven slush pump was utilized to lower the level of the water in the enclosure sufficiently to dry the electric motor which operated a Layne-Bowler deep-well turbine pump. The pump relied upon a patented rubber gasket to seal off any possible surface contamination from the well. Unfortunately, the seal had been omitted; consequently, the water remaining in the enclosure, along with all later seepage through the sand-bag levee, found its way into the distribution system, causing gross pollution of the supply.

Warnings of Pollution

Immediate notice was given to all consumers by messengers, over the telephone and through the daily paper, to boil all water used for drinking purposes and in the preparation of foods. The daily paper never ceased to operate in those trying days and proved of great assistance to the Water Department in safeguarding the health of the citizens and the thousands of refugees seeking safety in the city.

In an effort to further safeguard the supply, a chlorinator was installed. The chlorinator injected liquid chlorine into the discharge of the pump against the pressure maintained on the distribution system by means of a small plunger pump operating through the chlorine injector at a head of 200 pounds. After this installation was made, it was believed that the whole trouble caused by pollution of the water had been eliminated. It was soon realized that the interruptions in service experienced from one cause or another gave rise to another source of contamination. Because of the many open faucets and a few leaks in the mains, a marked infiltration of the muddy waters of the flood was noticed following every interruption in service. There was no means of adequately overcoming this situation, since only one pump was available for supplying the system, and there was only one available power source for operating this pump. These conditions made it necessary to boil all water for domestic purposes for the entire duration of the flood.

Steps to Prevent a Recurrence

A source of supply was the major worry during the flood and was given undivided attention in order to reach at least a partially satisfactory solution. A boat patrol was necessary for the location and elimination of waste from services left open by fleeing consumers, and damages to the distribution system by large boats in the streets. This work was very difficult, and it would have been much simpler with the aid of an accurate map of the entire system. All valves and services had to be located by the

guess-and-try method, which proved to be very unsatisfactory.

New, improved types of wells, extending the entire well casings above the surface of the ground to a sufficient height to avoid any possibility of contamination from inundation by flood water, are being drilled. The wells are equipped with turbine pumps with above-ground discharge, and are driven by electric motors deriving energy from two sources—a gasoline engine generator or the city distribution system. The old partially submerged reservoirs are being replaced by a new and larger storage system, which will be constructed above flood level and thus maintain a small external pressure on the distribution system in case of interruption in pumping service. All secondary pumping equipment will be located in a new structure adjacent to the storage basin and a part of it. The old system of pumping water directly from well to mains has, so far as possible, been permanently protected from flood waters.

The distribution system has been accurately mapped, with all mains, services, valves and hydrants located in a manner which readily permits relocation of any part of the system by measurements from any residence or other adjacent building. The making of the map required considerable labor, but has proved well worth the trouble and a great help at all times.

ACKNOWLEDGMENT.—From a paper presented before the American Water Works Association.

An Architectural Water Tank

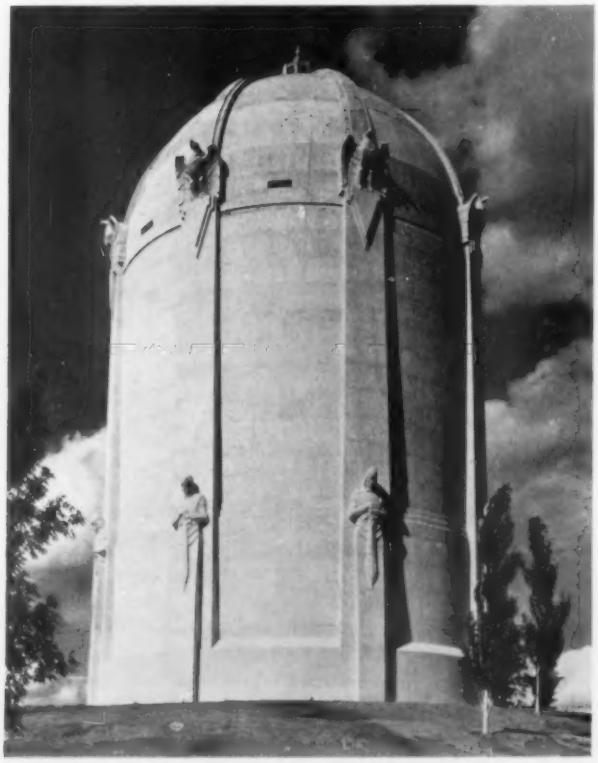
A building of prosaic utility may be also a thing of beauty. So reasoned the city fathers of Minneapolis, Minn., in commissioning Harry W. Jones, architect, W. S. Hewett, concrete engineer, and John K. Daniels, sculptor, to design and construct the Washburn Park water tower, recently completed in that city.

Situated on an eminence in the residential section to which it distributes water, this beautifully proportioned concrete structure can be seen for miles. It measures 135 feet in height and 75 feet in diameter.

From each of the eight buttresses around the base emerges the warlike figure of a Viking, clad in armor and grasping a great sword, symbolizing the hardy Nordic peoples who have contributed so much to the greatness of Minnesota. Capping each buttress is an American eagle.

Surmounting the ribbed dome, a cupola supports a regulation aeronautical beacon light.

GRACE K. PLANT.



THE WASHBURN PARK WATER TOWER, MINNEAPOLIS

"Don't Skimp on Play!"

THIS is the advice given by William Butterworth, a former president of the Chamber of Commerce of the United States, in an article warning against injurious economy, in the January number of *East St. Louis Today*, one of a group of Chamber of Commerce magazines published by the Community Service Corporation of St. Louis.

"I am wholeheartedly in agreement with those who are interested in reducing the cost of government," says Mr. Butterworth. "Furthermore, I think that municipal recreation agencies should economize, and wherever municipal conditions make budget cuts imperative, they should take their fair share of the reduction.

"And yet, I think it would be a great mistake to curtail recreation and other human services of government to the degree that such curtailment sacrifices the health, welfare, and happiness of children and youth and adults, especially those out of employment, at a time when they need these services as they have never needed them before.

"'The children of depression are just as important as the children of prosperity,' someone has said. They are not responsible for our difficulties of unemployment and declining markets. They are growing up under especially difficult conditions as it is. During these times, it is very important that they should be aided in keeping a sane outlook on life. . . .

"In the St. Charles Reformatory in Illinois, the taxpayers pay $500 a year to maintain one boy. There are 800 of these boys in that one institution. It costs $500 to maintain a girl for a year, and there are 500 girls in the same reformatory. In the states of Illinois and Indiana, the unit cost for public recreation facilities, including playgrounds, swimming pools, wading pools, athletic fields, bathing beaches, and recreation centers, is only $0.056, or the price of a package of chewing gum. In 23 states selected for year-round programs of a high degree of efficiency, it costs only $0.72 each time a child uses a playground or an adult an evening recreation center.

"If a boy should patronize a playground 200 times a year, the annual cost to the city for his recreation would be less than $15. Of the 12 most populous cities in the United States, San Francisco, the one which expended the most to maintain its recreation program, last year had an outlay of only 93 cents per capita.

"From these figures it is apparent that municipal recreation is one of the most inexpensive types of health insurance and citizenship training. It should also be clear that expenditures for recreation cannot be drastically cut without injuring the recreation program, and, furthermore, that to take money from municipal recreation budgets will not be an appreciable contribution to saving money for the taxpayers. Municipal recreation costs were last year only 1 per cent of all local government costs, according to a study made by the National Recreation Association."

THE SLUDGE DUMP AT THE BACK RIVER SEWAGE TREATMENT PLANT, BALTIMORE, MD.

The Baltimore Sewage Treatment Plant, and Experimental Work

By GEORGE E. FINCK
Sewerage Engineer

THE Baltimore sewage works is situated on the west shore of Back River, approximately seven miles from the city. It comprises a total area of about 550 acres and receives between 60 and 65 million gallons of sewage daily from an approximate population of slightly more than 700,000. The plant was placed in operation in November, 1911, and numerous improvements have been and are being made to maintain its operation in conformity with the latest developments in sewage treatment.

On being received at the plant from a 12-foot outfall sewer, the sewage first flows through a bar screen house to a meter house, and from there through four settling tanks, each of which is 103 feet by 420 feet with a depth varying from 10 to 14 feet. Each tank is designed to treat approximately 30 million gallons daily of sewage with a detention period of approximately two hours.

The settled sewage continues through four revolving screens, and thence through conduits containing butterfly valves to 30 acres of trickling filters, which are 8.5 feet deep. Upon leaving the filters, the sewage flows first through two final settling tanks, each approximately 300 feet square by 10 feet deep, from which it passes to a hydro-electric plant automatically operated, and then through effluent conduits 2,500 feet in length into Back River.

The bar screens consist of bars 1¼ x ½-inch in cross-section, spaced ⅞-inch apart, and have a total surface area of 1,125 square feet when completely submerged, and the area of the clear openings is 674 square feet, approximately six times the cross-sectional area of the outfall sewers at its outlet. The screens, which are 11 feet 10 inches long, are cleaned by hand raking.

The sludge in the primary settling tanks is pumped to the digestion tanks, of which there are fifty-three, with capacities varying from 20,000 to 300,000 cubic feet, and with a total capacity of 2,753,000 cubic feet. Part of the sludge is pumped and the remainder flows by gravity to the sludge drying beds, comprising a total area of 570,200 square feet, one of the largest sludge drying-bed areas in this country.

Sludge Disposal

The problem of the final disposal of the sludge has, at least for the time being, been solved at Baltimore. In the past large quantities of the material have been pumped into lagoons, some of which have later been graded and converted into attractive lawns. Although considerable quantities of the material are disposed of in this manner, the major portion is given to farmers, who often haul it for distances as great as twenty miles. The quantity of sludge removed from the sludge beds during the past five years has varied from 20,600 to 28,100 cubic yards per year.

The sludge drying beds are divided into compartments separated by precast reinforced concrete partitions 2 inches thick and 20 inches high, projecting 14½ inches above the sand. When a bed is ready to be cleaned, a strip of sludge about 4 feet wide is cleared away in the center of each compartment. This sludge is thrown to one side or the other, and later is rehandled. A temporary track is then laid on the sand in the cleared space, and is connected to the main track by means of a switch.

It has been found, with the present number of cleanings per year, to be more economical to use portable track than permanent track. Should the time come when the

beds can be cleaned oftener, a permanent track can be readily installed. The sludge is then loaded into the dump cars by hand and is finally removed to a sludge dump, as shown in the accompanying photograph.

During the early years that the sewage works were operated the quantities of undigested and dried sludge were small and the satisfactory disposal of this material was a simple problem. A few years later, however, the quantities became so great that ways of permanently disposing of it were studied. From 1916 to 1921 considerable quantities of the sludge were disposed of to a private company, which heat-dried it and sold it as a filler for fertilizer. Considerable money was lost by this method of sludge disposal, and since 1923 the dried sludge, which contains approximately 2 per cent nitrogen as ammonia, has been given without cost to farmers and others who use it for fertilizing purposes. Previous to 1922 no adequate facilities for loading sludge on farmers' trucks and wagons were available, and consequently during that year an old 5-ton locomotive crane was put in service for this purpose. During the following year the quantity of sludge removed had increased approximately 100 per cent as compared with that distributed during 1922. This was so successful that a new crane was purchased in 1927 to replace the old unit, which had worn out. The quantity of sludge given away has been gradually increasing and has totaled over 38,000 cubic yards in 1930, approximately 45 per cent more material than was removed from the drying beds during that year.

Since 1919 it has frequently been necessary to find additional storage space for undigested sludge, owing to lack of sufficient digestion tank capacity. Since then large quantities of both raw and partly digested sludge have been pumped into four lagoons. The first of these to be put in service was a narrow strip of ground about 50 by 800 feet. By building an earth dam at one end of this area, a storage space about 8 feet deep was provided. Both raw and partly digested sludge was pumped into this lagoon for a period of four or five years. Frequently, large quantities of water were siphoned off to make room for more sludge and to dry up the contents. The sludge continued to dry and become more compact. A layer of earth varying in thickness from 12 to 24 inches was deposited on top of this sludge, and the area has since been converted into a lawn.

Sludge as a Fertilizer

In 1922 a lagoon was constructed with a total capacity of 41,000 cubic yards. Raw sludge with a moisture content of approximately 92 per cent was mixed with a small quantity of digested material and then pumped into the lagoon. After a period of years the sludge became thoroughly digested and large quantities of water drained off and evaporated. The material now has a moisture of about 70 per cent and is being hauled away by farmers. One advantage this material has over air-dried sludge is that it is free from sand and therefore possesses a higher nitrogen content. Truck farmers in the vicinity of the sewage works are the biggest users of the sludge. They place it on land where crops consisting of spinach, kale, tomatoes, cabbage, etc., are grown. The sludge has been used with considerable success on lawns of the city parks, at the municipal filtration plant and other places.

An airplane manufacturing plant, situated about four miles from the sewage works, is now procuring sludge for use in place of top soil on an airplane field adjacent to the plant. The sludge is uniformly spread over the ground, mixed with the soil by means of a disk harrow and tooth-harrowed. The process of harrowing is repeated until the sludge is thoroughly mixed with the soil. The ground is then seeded. The quantity of sludge used is equivalent to a layer 1 inch thick, or about 134 cubic yards per acre. If the demand for sludge continues as it has during the past few years, all the excess material at the sewage works will be disposed of within two or three years, and the total annual output of dried sludge will be distributed for fertilizing purposes.

During the early period immediately after the sewage works were placed in operation, the sludge was sold for 25 cents per load. This was later raised to 35 cents and the farmers practically stopped taking the sludge. Since 1921 no charge has been made for the material. It is important to have the sludge removed as promptly as possible in order to prevent rehandling at considerable expense. Furthermore, the material presents an unsightly appearance, occupying land that might be used for more suitable purposes.

Experimental Work on Dewatering

A series of experiments has been conducted on the dewatering of digested sludge by the vacuum filtration process. Two experimental filters were installed, one made by the Bartlett-Hayward Co., called a Genter filter, and the other by the Oliver United Filters, Inc. Both filters were found capable of satisfactory dewatering digested sludge.

A maximum output of approximately 20 pounds of dry solids per square foot of filter area per hour was obtained when using a Genter filter and coagulating the sludge with 10½ pounds of ferric chloride per 100 pounds of dry solids. The Oliver filter produced a maximum output of about 18 pounds of dry solids when using 12 pounds of ferric chloride per 100 pounds of dry material. It is believed that when operating under the same conditions the capacities of the two filters should be about the same.

The costs vary from $4.22 to $5.00 per ton of dry solids, depending upon the quantity of coagulant used and the nature of the digested sludge to be dewatered. The average cost of air-dried sludge at Baltimore for the years 1925 to 1931 was $6.23 per ton of dry solids, or 24 per cent higher than when using vacuum filtration at a cost of $5.00 per ton.

Experiments with the Bartlett-Hayward filter were begun September 3, 1931, and completed July 26, 1932. The work during the first seven months was of a preliminary character and consisted of experimenting with different types of filter cloth, different coagulants, and various methods of cake removal, together with numerous other tests. Fifty-eight tests on digested sludge were conducted, each lasting from 1 to 14 hours. Ten tests lasting from 1 to 1½ hours were made on semi-digested sludge, and two groups of tests were conducted on raw sludge. Experiments using the Oliver filter were begun January 26, 1932, and concluded August 29, 1932. The tests were made at two different times. The first group was made from February 18 to April 5, 1932, and the second from July 8 to August 29, 1932. In the first group 27 tests were made, which varied in length from a minimum of 1½ hours to a maximum of 14 hours, and in the second

group 39 tests were made, varying from a minimum of 56 minutes to a maximum of 2 hours. Six tests, covering a total of 11½ hours, were made on the dewatering of semi-digested sludge, and a few tests with raw sludge.

The tests with both filters were sufficiently long and were carried out in enough detail to indicate that either one would perform the work for which it is designed, and the merits of the process are sufficiently attractive to warrant the purchase of filtering equipment for the Baltimore sewage treatment plant when funds become available.

More recent improvements at the plant have consisted of the erection of a mechanical screen building with provision made for three automatically cleaned coarse bar screens to treat a total flow of 290 mgd. At present, however, only two screens are installed. Two preliminary settling tanks 140 feet square and 15 feet deep at the side walls have been constructed. Each tank is designed to treat approximately 25 mgd of sewage with a detention period of approximately two hours. A sludge control station is being built, provided with sludge pumps, metering equipment for determining sewage flow, and gas boilers which will use the gas collected from sludge digestion tanks. Plans are being prepared for the installation of two separate sludge digestion tanks, each 100 feet in diameter and 25 feet deep. They will be provided with concrete covers, with provisions for collecting the gases and heating by means of hot water coils.

The Baltimore sewage works is under the general supervision of B. L. Crozier, Chief Engineer of the Department of Public Works, and with the writer as Sewerage Engineer.

A Study of Long Haul and Short Haul in Refuse Collection and Disposal

Abstract of a Report of the Citizens League of Cleveland, Ohio

AFTER a decision had been made to build one large incinerator in Cleveland to supplant earlier methods of disposal of municipally collected rubbish, the Citizens League of Cleveland presented an interesting report advocating five smaller incinerating plants, although the cost of construction and operation was considerably more than for one central incinerating plant. This handicap was readily overcome by the cost of the much shorter haul. The report which is abstracted below quotes from the experience of other cities.

Disposal of Reduction Long Favored

The city of Cleveland produces annually approximately 120,000 tons of garbage, 60,000 tons of rubbish and 600,000 cubic yards of ashes, all of which must be collected and disposed of in a sanitary manner. According to the figures supplied by the Director of Public Service, the cost of collection and disposal of household waste for 1929, 1930 and 1931 in Cleveland has been approximately as follows:

	1929	1930	1931
Ash and rubbish collected	$447,499	$501,381	$473,493
Dump maintenance	58,098	39,925	64,029
Wastepaper collection	11,879	13,047	13,500
Supervision and inspection	40,436	32,039	37,223
Garbage collection	680,985	690,142	647,645
Garbage disposal (net)	14,955	121,678	185,830
Total cost	$1,253,852	$1,398,212	$1,421,720

The item of supervision and inspection is one-half of the total supervision and inspection cost for the entire street division.

At present, garbage is sent to the reduction plant, rubbish is burned on dumps, and ashes are used in fills. For many years the operation of the garbage plant proved to be highly profitable through the sale of grease and fertilizer. The profits from disposal went far toward meeting the costs of collection. Later, as the plant depreciated, as the rate of pay for labor increased, and as the sale value of the by-products decreased, the plant became unprofitable. The following table includes the figures for a few of the last twenty years, showing the changes which have occurred:

Year	Tons Collected	Grease Pounds Extracted	Fertilizer Tons Recovered	Profits from Sales
1914	55,730	3,290,105	5,878	$ 53,170
1916	60,717	3,819,325	7,937	148,812
1918	57,754	2,726,786	6,329	172,100
1925	143,575	4,341,160	11,984	—25,463
1928	131,837	4,401,370	13,720	—25,062
1931	116,469	4,019,755	12,741	—185,830

Thus it will be seen that the reduction plant changed from a net profit of $172,100 in 1918 to a net loss of $185,830 in 1931, a difference of $357,930 in the span of thirteen years. The disappearance of the profits from the sale of by-products has forced consideration of some method other than reduction. Grease from the Cleveland plant used to sell for 4 to 6 cents per pound; and the tankage or fertilizer for $8 to $10 per ton. In 1932 grease sold for ⅝-cent per pound, and the recent bids for 1933 were only ¾-cent. Fertilizer is now selling for less than $2.50 per ton, and there is little market for it even at that price.

Incineration Now Favored

Estimates by city officials give the following costs for one central incinerating plant to replace the reduction plant, and also for five incinerating plants:

Interest on $700,000 (cost of plant) at 5 per cent	$ 35,000.00
Bond retirement (20 years at 5 per cent) annual	21,000.00
Operation of plant, 175,000 tons ($1 per ton)	175,000.00
Total annual cost of disposal	$231,000.00
Cost per ton of garbage and rubbish	$ 1.32

FIVE SMALLER INCINERATING PLANTS

Interest on $1,500,000 (plants and land 5 per cent)	$ 82,500.00
Bond retirement (20 years at 5 per cent) annual	45,000.00
Operation of plants, 175,000 at $1 per ton	175,000.00
Total annual cost of disposal	$302,500.00
Cost per ton of garbage and rubbish	$ 1.73

The administration favors one large central incinerator located at a point convenient to the downtown section of the city.

Long or Short Haul

One of the important questions involved in considering one central incinerating plant or five smaller incinerating plants at convenient points in different parts of the city is the problem of long or short haul. If the reduction method is adopted, the long haul must be continued, because it is not practicable to construct and operate more than one reduction plant. If the incinerator method is adopted, the rubbish and garbage can be collected in the same trucks, and four or five incinerators conveniently located can be erected to burn the waste. Unfortunately, no detailed figures showing the differences in cost between the long and the short haul have been compiled in Cleveland. In recent studies made in Detroit by the Detroit Bureau of Governmental Research, however, the engineers reached the conclusion that the construction of five or six incinerators in different parts of the city would reduce the collection costs about 50 per cent.

A similar investigation in Cincinnati by the city manager's office, and a detailed study of the cost of collecting garbage and rubbish together within short-haul districts, would show at least a 50 per cent saving in the cost of collection. On the basis of that report Cincinnati has constructed three conveniently located incinerator plants in different parts of the city, and the first year of operation showed only a slight increase over the estimate.

The city of Louisville has adopted the three-incinerator plan, which has proved very satisfactory, since the city has saved the cost of operation of these plants through the shorter collection hauls. H. W. Fledderman, Chief of the Division of Street Cleaning, says: "The greatest objection to an incinerator plant is the garbage teams and trucks going to and from the plant, and to have all of this equipment going into one central plant would not only create a nuisance but would add to traffic congestion."

Harrington Place, Engineer, Bureau of Governmental Research, who made the survey for Detroit, states: "An 800-ton plant, as contemplated for Cleveland, is a very large affair, and means that all of the waste-collection traffic of the city will converge at one point, and it is probable that traffic congestion will result. This naturally will mean that expensive and probably over-manned collection units will lose a great deal of time in such congestion."

The Director of Public Works of Toronto, Ont., where there are three plants, is of the opinion that the advantages of the short haul are more than over-balanced by the economies of operation of a single central plant. Toronto has a 300-ton plant a mile from the center of the city, the longest haul to which is 6 miles; and a 400-ton plant, one mile from the center of the city, in the opposite direction. The third, another 400-ton plant, is being constructed on the outskirts of the city and will have a maximum haul of 6 miles. It is interesting, however, to note that Toronto has adopted the policy of multiple incinerators.

Another Objection to a Central Plant

Another element involved in the question of single or multiple incinerators is the violent opposition of the people of any section of the city to the location of a large incineration plant in their neighborhood, with the constant passing of loaded garbage and rubbish wagons. While vigorous objection may be expected from any neighborhood, even against the erection of a smaller plant in that section, the opposition in that case would be less violent, because the haulage would be less, and no section could object seriously to taking care of its own waste.

The marked improvements in the construction of incinerators in the last few years has largely overcome the difficulty of odors. Modern plants are now being erected in residential sections near schools and hospitals and contiguous to business districts without creating any nuisance. Furthermore, the wrapping of garbage in newspapers, which is now generally required and practiced in cities that have incinerators, has reduced the nuisance of loaded trucks traveling along the streets. The main objection to a central plant therefore is the long haul and traffic congestion on the streets leading to the plant.

Newspaper Cooperation for Constructive Economy

AN interesting example of the use of material from THE AMERICAN CITY in a newspaper campaign for constructive municipal economy, is the following editorial, published in the *Redwood City* (Calif.) *Tribune* of February 17:

Caution Must Guide in Cutting Tax So as Not to Cripple City

Notwithstanding that *The Tribune* is fully in sympathy with any carefully worked out plan of relief for the Redwood City taxpayer, it nevertheless believes that the "caution" signal shows ahead on the track. There is a point beyond which the city's budget cannot be curtailed without seriously impairing governmental efficiency and public service.

It is very well to throw a scare into the officials where needed by citing what is going on in Chicago, Philadelphia, New York or Detroit, but it isn't fair to the city councils of hundreds of smaller American cities which have been ably run and are pulling over the grade without serious difficulty.

Redwood City is, to the credit of the city council and the city manager, about as well managed as could be wished for, with the city in excellent financial condition and enjoying the unique experience of a balanced budget. On the surface, there is nothing to indicate that a great many taxpayers are not able to meet their bills. On the contrary, the record shows that $72,540 has been paid into the treasury of the first installment of 1932-33 taxes, or 54 per cent of the total of $132,428.

That sane minds may rule the forthcoming tax reduction efforts. *The Tribune* quotes the following editorial* from the magazine, THE AMERICAN CITY, as agreeing in general with its own views:

"It has become fashionable to decry government and taxes. Demands for indiscriminate budget-slashing are the order of the day. So-called economy leagues are springing up all over the country. Embattled taxpayers are organizing strikes. Fluent orators are taking the air to attack government and the costs of government.

"If this rising wave of propaganda were a real aid to constructive economy; if it were generally based on scientific analysis; if it were consistently advocating advancing standards of governmental services with elimination of waste, inefficiency and graft—it would be a wholesome and desirable thing.

"Such is far from the case. The movement in some of its aspects is almost anarchistic in its tendency to cripple the beneficial activities of public bodies. A depression which persists because we are spending too little is widely proclaimed to be curable by spending even less."

* Excerpts from page 39 of the February number of THE AMERICAN CITY—"Are Local Expenditures Excessive?"

A New Type of Protected Trafficway Being Built in Westchester County, N. Y.

By HOWARD M. BASSETT

PARKWAYS were developed about twenty years ago as special roadways bordered by green strips to save from injury adjacent land. One of the first and best known was Bronx River Parkway in Westchester County. A parkway might be termed a protected thoroughfare for *special traffic*, that is, recreational or passenger traffic. A protected thoroughfare of the same type for *general traffic* has no name in the dictionary and no existence in common knowledge. At last this protection to a thoroughfare for general traffic is about to be accomplished in Westchester County, in one case for fifteen miles as part of a relief channel for general traffic now using the Albany Post Road, and in another case for thirteen miles as a complete relief channel for the general traffic now using the Boston Post Road.

Twenty years ago, the rapid increase in vehicular traffic produced an obvious need for some margin or screen to save from injury the normal land uses of adjacent land from the noise, fumes, vibration and physical dangers of highway traffic. The need was met by taking the only convenient form of land use at hand, the common park, and laying out strips of land for such use for great distances so that a central park drive might become thus a protected trafficway. The result was, however, in the eyes of the law, still a park and not a highway.

The elongated park, nevertheless, now fills an indispensable place in the modern traffic system. Looking backward over this period of development, one sees much cause to regret that through-commercial traffic has not sooner been insulated by this type of protected thoroughfare, since it has been more harmful than passenger traffic to abutting land along business streets and once handsome post roads.

Central Westchester Parkway

The first endeavor in this direction in Westchester is a connecting link of about two miles between two existing major highways and by-passing one of the very handsome streets in the city of White Plains which was depreciating under the increasing burden of through traffic. Central Westchester Parkway was opened about a year ago as a mixed traffic drive. It is beautifully landscaped upon a broad strip of land and crossed by many ornamental bridges characteristic of the Westchester parkways. Instead of the familiar blight of a by-pass highway upon its surroundings, this one cleared away many flimsy buildings occupying a neglected valley and produced, in its place, a permanent and modern improvement of value and beauty.

Briarcliff-Peekskill Parkway

The city of Yonkers and the villages of Hastings, Dobbs Ferry, Tarrytown, Ossining and Peekskill and others form a row of very old communities along the eastern shore of the Hudson River and are connected by the equally old and stately Albany Post Road. Much heavy traffic is forced to traverse it. To preserve the Albany Post Road from further injury, the Westchester County Park Commission has purchased and graded a fifteen-mile strip of land known as the Briarcliff-Peekskill Parkway, upon which the New York State Highway Department will begin the laying of a roadway within the next few months as part of a plan to open it upon completion for all kinds of traffic. It will form a part of a by-pass and a relief channel of about thirty miles in length parallel to the Albany Post Road and from three to five miles inland from the Hudson River and will pass through practically undeveloped country for its entire length.

The result therefore will be parallel strips or ribbons of park land and highway land. So far as is known, this never has been accomplished in the United States to date except for very short distances.

Pelham-Port Chester Parkway

The city of New Rochelle and the villages of Pelham, Larchmont, Mamaroneck, Harrison, Rye and Port Chester form an almost continuous suburban development for a distance of thirteen miles along the north shore of Long Island Sound. They are traversed by the Boston Post Road from the New York City line to the Connecticut boundary. It is said that more night and day traffic passes over this road than over any other road leading out of New York City.

At a cost to date of about five million dollars, the Westchester County Park Commission has purchased a strip of land known as the Pelham-Port Chester Parkway as a relief channel for commercial trunk-line traffic passing from the port of New York through the county to the most densely populated and industrialized region of New England.

Provision has been made for two roadways, each 34 feet, for separated directional traffic, on this strip of land. It will be adjacent to the tracks of the New York, New Haven & Hartford Railroad for the greater part of the distance. This will allow the railroad to form 50 per cent of the protection needed and permit the traffic to pass through that part of the region where the least harm will be done. It will be a protected or "parked" trunk highway, but one would not ordinarily classify it as a parkway.

Upon completion of these two newest relief channels Westchester County will have much cause for congratulation. The county forms the only mainland approach to New York City. Great parkways have been necessary to provide protection for trunk-line passenger traffic, and these two by-pass channels are to provide protection for trunk-line commercial and freight as well as for passenger traffic.

The need for a legitimate type of protected thoroughfare for general traffic is already so great in other sections of the country that its development is inevitable. It will probably be called a Freeway.* Whatever happens will undoubtedly serve only to enhance the importance of this pioneer work in Westchester County.

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* NOTE.—In THE AMERICAN CITY, November, 1932, appeared an article entitled, "A New Type of Thoroughfare: The 'Freeway' ", by Latham C. Squire and Howard M. Bassett. The three kinds of thoroughfares are there described as follows:

A "highway" is a strip of public land devoted to *movement* over which the abutting property owners have the rights of light, air and access.

A "parkway" is a strip of public land devoted to *recreation* over which the abutting property owners have *no* rights of light, air or access.

A "freeway" is a strip of public land devoted to *movement* over which the abutting property owners have *no* rights of light, air or access.

Conduit Freeways

Once the new type of thoroughfare has been brought into existence on some major project, and officials and the public have become familiar with its qualities, it will immediately be discovered to have several other uses.

For instance, we already have new roadways at or near grade which connect with some of our recently built bridges: roadways which are carefully termed "bridge approach" and not "street." On the New Jersey side of the new Hudson vehicular tunnel a new roadway is termed "viaduct." These are actually freeways in all respects except name. Each could be extended for miles so long as the word "street" or "highway" was not used at the time of the land acquisition. No right of access in abutting owners would attach so long as the words "bridge approach," "express viaduct" or "freeway" were used and not the fatal conventional word "street" or "highway."

In these cases and in many others the need is for clean-cut roadways free from the thousand-and-one rights of access that attach to a new highway and soon clog it like rust in an iron pipe.

Still another beneficial result can be achieved by the use of a freeway in the prevention of numerous local street crossings. Some new boulevards, like Roosevelt Boulevard in Philadelphia and Conduit Boulevard, now called Sunrise Highway, in New York, are crossed by every local street in each new suburban development along the route. Four out of five of these local streets should dead-end at the boulevard and not cross it. Because of the legal character of highways and freeways the latter can accomplish this and the former cannot.

Much has been written about the growth of temporary and unsightly buildings along main highways. The real cause seems to have been overlooked by many. It is obvious that the real cause is the adverse effect of the highway itself upon normal business and residence rentals. Such adjacent land has had trouble in earning any reasonable return on its normal value for from ten to fifteen years. The temporary and unsightly buildings being built are mere makeshifts and are usually unsuccessful in rewarding the owners for their efforts to earn an income from highway patronage except in the few strategic locations. The truth is that the land has been impoverished like land next to a trunk-line railroad. Substantial residence and business structures are not and will not be built thereon. It is futile to attempt to cure the condition to any great extent by the regulation of roadside development. The objectionable character of through traffic has destroyed abutting land for normal residence and business uses to a depth of from 100 to 200 feet. The land thus impoverished should be appropriated in the beginning as incidental to the highway and as protection to privately owned land nearby. This is exactly what the freeway makes it possible to do.

It is not unreasonable to suppose that in twenty years more we shall have as many of these newest type trafficways as we have parkways today.

Benefits of a Tax Map to a Municipality

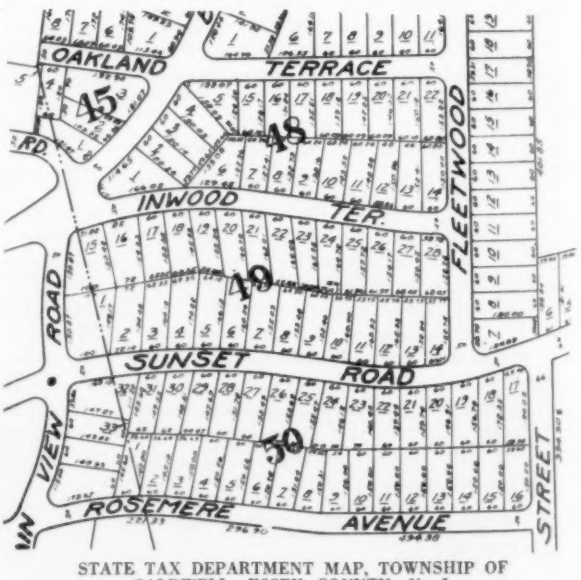
By JOHN B. OPDYKE, C.E.
Of Boughton and Lawson,
Consulting Engineers, Newark, N. J.

IN attempting to meet present-day protests against high tax rates, there is much study by municipal officials of methods of cutting governmental costs, but too little consideration of the importance of levying taxes in such a way that no individual or corporation bears an unfair proportion of the total burden.

The problem of cutting costs in a municipality is outside the scope of this paper. The use of a tax map will do much towards equalizing the tax burden and frequently aids materially in reducing the tax rate. Practically all the larger municipalities have tax maps. They realize the aid of the maps to their assessors. Most of the smaller municipalities do not have such maps, but to these communities a tax map is as necessary as it is to a large city.

In almost all municipalities the great bulk of the taxes comes from real estate. Modern practice demands the separate assessment of land and improvements.

Land is a real, tangible asset, but hard to assess. Its assessment depends upon its location (with respect to roads, rivers, other properties), its size and its character (whether fertile, woody, swampy, etc.). Without a tax map it is extremely difficult and almost impossible for an assessor to definitely determine all these things for every piece of ground.



STATE TAX DEPARTMENT MAP, TOWNSHIP OF CALDWELL, ESSEX COUNTY, N. J.

Definite Locations and Correct Measurements Available

When a municipality has a tax map, the location of each piece of ground is instantly available. This means that each piece of property can be assessed on its own merits. There will be no more "blanket" assessments, which cover all a man's property, regardless of location or character. The use of separate assessments on different pieces of

property owned by the same man often increases the total valuation of the man's holdings. In such cases it is evident that the owner had not been carrying his full load of the taxes before the introduction of the tax map.

In the early days of the United States, especially in the East, many errors appeared in the surveys made. Sometimes differences of as much as twenty feet appeared in two measurements of the same line. In those days, the corner was well marked and the distance was not important. These errors crept into the areas as written in the deeds. The deed area is rarely exact. The actual area is frequently more, and infrequently less, than the deed area. The only way to get the true area is to plot up a large section, such as is inclosed by natural boundaries, and fit in all the deeds.

When a tax map is drawn up, a great deal of field work is necessary to definitely locate the roads, the streams and the important corners. An aerial photograph is also an important adjunct of the work. This photograph shows all property lines that are in any way marked, with ditches, hedges, fences, etc. Such accurate plotting gives the area of each parcel of land as it lies on the ground, and, as a rule, increases the total amount of land to be taxed. Naturally, with more land to be taxed, the tax rate will descend.

Recovering "Lost" Land

When a careful plotting is made, much "lost" land comes to light. This lost land originates from several causes. First, it may be unsold land left in a large tract which has been cut up and sold. Sometimes the original owner has believed that he has sold every bit of land in the tract and is amazed to find he is yet a landowner. Second, it may be property left to heirs who were unknown to the tax collector, and, the tax not being paid, some new collector felt that there was no use in carrying the property on the books, thus losing a possibility of collecting taxes. There are other methods of losing property, but they are similar to the foregoing. A part of this lost land is known about, but the owner says the burden is on the assessor and demands proof of the reason for the assessment or the bill, and since the assessor is not positive, he is helpless. The land cannot be sold for taxes, because the assessor is not sure that it is there. This situation is very unfair, and cannot be remedied until a tax map is put into use. That shows all the land, including the lost pieces. If it is not paid for, it can be sold for taxes, since it is there. Proof exists for the assessment and the bill. Lost land located means increased revenue, always an advantage to any organization, and especially attractive to a government, because it is a means to a lower tax rate.

When a Farm Becomes a Subdivision

When a farm is cut up into streets and lots, an increased value exists on that land because of the work put into it. Since it is not used for farming, it should not be assessed as farm land. Each individual lot is valued by the owner at a greater amount than the same area of farm land, so it should not be assessed on the same basis as farms are. It is not enough to have a map of the subdivision and to know the number of lots; it is necessary to have the subdivision oriented on a map of the whole town, so that all influencing factors may be considered. A tax map is invaluable here.

The matter of equitable assessments is based on the exact location and exact size of every parcel of land in the municipality, and upon the assessment of every piece of property there. It is important to rate subdivisions properly. Equitable assessments are much desired by the government and the governed alike; by the first, because equitable assessments mean a way of enticing new residents with a corresponding growth to the municipality; by the governed, who pay the taxes, because no one will feel that he is being made to pay an unjust tax. Unjust tax burdens mean that the taxpayers move away and the ratables decrease. Just taxes mean more residents and an increase in ratables. The use of a tax map brings about equitable assessments, often increases the valuations and frequently increases the amount of taxable property.

It must be borne in mind, however, that no tax map is useful to its utmost unless it is revised each year. If it is drawn up and not corrected for several years, any assessments made according to it would be liable to error. Each year all the transcripts should be plotted on the map and all new subdivisions drawn in. In this way, and in this way only, can assessments be kept impartial and the possibility of more lost land be eradicated.

Other Uses for the Tax Map

The primary use of a tax map is for taxation purposes, but it has many other uses. It may be used as a basis for proposed improvements. After the improvements are put in, the tax map may be used to show the location of all parts of the improvements; for example, in a water system all hydrants, gate valves, tees, dead ends, etc., may be shown. This is a great help to the water-works superintendent. The careful keeping of such data necessitates a map, so the presence of a tax map means a monetary saving to the municipality.

A tax map is useful before the straightening of old roads, the creation of new roads, and the approval of a proposed development by the officials.

A city plan is necessary to all growing communities. Without such a plan, all sorts of difficulties crop up. As property increases in value, roads are found to be too narrow, drainage is found to be inadequate, playgrounds for children are lacking, and cheap shops spoil otherwise desirable locations. If a little had been added to the original cost of installation, much would have been saved later. The tax map is very useful to the men who are designing the city plan or zoning the city. City planning and zoning, if done wisely, bring in desirable residents and keep out unwelcome industries and cheap promoters.

A tax map, at first thought, may seem to some to be an unwarranted expenditure, but it causes more accurate assessing and usually pays for itself many times over by increased ratables due directly to the map and not to an artificial boosting of values.

New School, Lower Taxes, No Pay Cuts

A NEW $500,000 junior high school was opened in Ithaca, N. Y., last fall without floating bonds or raising taxes, says Clyde B. Moore, a School Board member, in *The Rotarian*. This was made possible by conserving surplus funds and including in the budget an item for future building needs. The school tax rate has been steadily reduced, without cutting salaries.

Campaigning for Good Teeth and Good Health

CITIES from one end of the country to the other have begun to look down in the mouth—but not because of the depression. They are waging war against a definitely recognized menace to the community health—bad teeth. Dr. F. E. Porath of Chicago estimates that bad teeth among school children cost his city $850,000 annually. The estimated annual cost to the nation, on the same basis, is more than $38,000,000.

Combating these conditions, thousands of civic, municipal and state clinics have been organized, and a number of outstanding dental hygiene programs have been successfully carried out. Estimates indicate that of the 6,000 clinics of all kinds in the United States, approximately 3,000 are today devoted to dental work. In a recent survey by the Committee on the Cost of Medical Care, 1,500 dental clinics reporting showed a total annual service to more than 2,000,000 patients. Much of the work was done without charge, the rest for a nominal fee. Hospitals support 368 clinics, boards of education account for another 252, local, county and state boards of health support 134, and local civic groups back 38.

Outstanding examples of successful dental hygiene work are found most often in the educational field. The public school program in Atlanta, Ga., is one of these. There the dental hygiene campaign is under the direction of Willis A. Sutton, Superintendent of Schools. Begun as an experiment, the program, at the end of five years, succeeded in cleaning up the mouth of every student in the schools. The result has been a great saving to the taxpayer, since it has cut down the number of poor students who had to repeat a year of study because their progress had been handicapped by bad teeth. It was an even greater saving to the children.

Similar to the Atlanta program is the one carried on in Chambersburg, Pa., under the supervision of U. L. Gordy, Superintendent of Schools, aided by Dr. C. J. Hollister, Chief of the Dental Division of the Pennsylvania State Department of Health, and Miss Martha Truhan, dental hygienist of the Chambersburg schools. Chambersburg celebrated in 1932 the completion of a ten-year dental hygiene program with a parade of more than 2,000 children boasting perfect teeth. Steady improvement in the mental attitude and the physical condition of students is reported by Mr. Gordy since the campaign began.

Louisiana is conducting a five-year dental health drive. State divisions of dental hygiene are found in Alabama, Connecticut, Delaware, Georgia, Maryland, Michigan, Mississippi, Tennessee, and Virginia. Indiana, although without a dental division in its State Health Department, cooperates with the State Dental Association in promoting a five-year program, and Iowa, through the Extension Division of the Dental College at the State University, also carries on a state-wide campaign. Massachusetts state authorities do extensive work among school children, and the Forsyth Clinic at Boston is considered one of the best in the country. Missouri has no division, but for many months a public health dentist has been working in the Division of Child Hygiene, campaigning for care of children's teeth. Work in New Mexico and Wisconsin is organized in county units. Forty county nurses cooperate in Wisconsin. Cities and counties also conduct their own programs, as in Columbus, a town with a population of 2,460, where over a period of five years defects in children's teeth were reduced from 80 to 12 per cent.

The rising importance being put upon public dental hygiene work by health groups makes it increasingly apparent that cities will be among the leaders in advances made.

DR. ALFRED WALKER,
Chairman, Educational Committee, American Dental Association.

Economic Stress Makes Anti-Tuberculosis Fight More Essential

EACH year the National Tuberculosis Association, 450 Seventh Avenue, New York, and its 2,084 affiliated associations throughout the country, strive to focus public attention on a single pertinent fact about tuberculosis through the medium of an educational campaign.

Beginning April 1, this educational message will urge that whenever a case of tuberculosis is discovered every contact should be examined. In numerous ways persons will be helped to find out whether they have the disease, to secure proper treatment, and to learn to protect others. Emphasis will be laid on the danger of the disease to children and the necessity of examining them with the tuberculin test and the X-ray. Because of the economic stress it is all the more necessary to build our defenses against the enemy, which strikes when resistance is low.

Physicians, health officers, public health nurses, social workers, civic groups and community leaders will participate. Insurance companies, employers, business organizations and others can help.

THE CHAMBERSBURG, PA., DENTAL HEALTH PARADE
The Chambersburg High-School band heading the procession, with Robert Patterson, leader, using a toothbrush for a baton

MACHINE CLEANING THE STREETS OF ROANOKE, VA.

1. The new pick-up sweeper when it was undergoing its approval tests before acceptance by the city. 2. The pick-up sweeper passing a parked car, showing how the gutter broom takes out dirt from around the wheels

Pick-up Sweepers and White Wings

ROANOKE, a city of about 72,000 population located in southwestern Virginia, occupies an area of about 10 square miles between the Blue Ridge and Allegheny Mountains about 940 feet above sea level. It has 101 miles of paved streets, all of which are cleaned either by pick-up sweepers or by white wings. In 1931, 8,448 linear miles, or 16,896 curb miles, were cleaned.

Because modern motor traffic stirs up street dirt and blows it toward the curb, the two Elgin motor sweepers are used only in the gutters. They sweep daily throughout the business section, starting at 1 o'clock in the morning and completing their round by 11:30 in the morning, when they are greased, oiled and fueled, ready for the next night's work. The sections cleaned daily include the business section, which is divided between the north and south sides of the city and includes 75 city blocks.

The two pick-up sweepers empty their 2¼-yard and 3-yard hoppers at suitable points where the piles of refuse may be left for a short period without causing inconvenience and nuisance in the immediate vicinity. Then the material is shoveled into a Ford truck by the truck driver and hauled to the clean ash dump. This one truck takes care of both sweepers. In their cycle of work the sweepers first clean the business section and then proceed to the residential section. All the paved residential streets are cleaned twice a week. The through roads and boulevards are cleaned three times a week and sometimes four, depending on the time of year and the accumulation of dirt.

In the business section, three white wings with can carriers go through the streets three or four times daily. There are also six men and a foreman with push brooms and two two-horse wagons which are used to pick up mud at intersections of paved and unpaved streets after storms and to clean up gutters both after storms and in the fall and spring, when leaves and trash accumulate rapidly.

The statistics for the fiscal year 1931 were:

Sweeping days for two machines	521
Days lost because of rain and bad weather	76
Days lost repairing machinery	55
Blocks swept	67,588
Gutter miles swept	16,896
Miles of street swept	8,448
Rotary brooms used	100
Gutter brooms used	55
Gasoline used, gallons	6,453
Motor oil used, gallons	135
Cost of sweeping per gutter mile	$0.617

Operating Costs

Operators and helpers	$6,075.70
Labor, hauling sweepers	1,185.60
Sweeper supplies	883.65
Gas, motor oil and grease	918.08
Repair parts	1,204.21
Labor for repairs	165.18
Total	$10,432.12

In the operation of the pick-up sweepers it has been found that hickory fiber wears longer and cleans better. The newer of the two pick-up sweepers is equipped with a left-hand broom which is a great help in pulling back dirt which has been scattered by the rotary broom when it hits a particularly heavy pile. When running fast, the right gutter broom will sometimes throw piles of dirt beyond the rotary. This is due to the tension of the steel used for the right gutter broom, which will sometimes even throw bricks and bottles across the street when the machine is operating faster than its normal speed. The Department in charge of street cleaning is expecting to supplement the work of the sweepers with a flusher, using a rebuilt city truck for the chassis.

The cleaning of streets in Roanoke is done by the Sanitary Department, W. L. Sink, Superintendent, under the direction of W. P. Hunter, City Manager.

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Los Angeles' $335,000 Beach Playground

Los Angeles, Calif.—What was formerly a barren and dangerous stretch of reefs and rocky coastline, dotted with ugly, tumbledown squatter-shanties, is today one of the most beautiful and completely developed public beach recreation centers in the country, as a result of a six-year development program just completed by the Los Angeles Department of Playground and Recreation.

The playground, named Cabrillo Beach in honor of Juan Rodriguez Cabrillo, who discovered Los Angeles harbor in 1542, occupies a unique position at the foot of the harbor breakwater, with half of its area facing toward the smooth waters inside the great stone barrier, and half bordering on the open sea. The seaweed-encrusted reefs at this point were purchased for public recreational purposes by the Board of Playground and Recreation Commissioners in 1927, at a cost of $31,838—a small price because of the comparative worthlessness of the land for other purposes. Since that time, a total of $334,950 has been spent in the development of the beach playground, which is today one of the most heavily used of the many recreation areas under the jurisdiction of the Los Angeles Board.

A huge filling process was begun, which resulted in covering the rocks and reefs with a million cubic yards of sand, brought in by pipe line from harbor dredging operations three miles away, at a cost of $142,803. With the completion of the fill, a beautiful triangular-shaped stretch of smooth-textured beach, 25 acres in area, was created as a new public playground.

Realizing the need for a "municipal yacht club"—which people of average means could make the center of boating activities ordinarily enjoyed only by the wealthy at private yacht clubs, the Los Angeles Recreation Department erected a handsome Spanish-type boathouse and pier, facing the sheltered waters inside the breakwater. Boats and boating equipment were placed at the disposal of the public, and a program of boating recreation was organized.

Lifelines and lifeguard facilities for the protection of bathers were also installed, and Cabrillo Beach began to attract an increasing attendance of people seeking recreation at the seaside. The boathouse, pier, and beach improvements, installed in 1928, were made at a cost slightly in excess of $70,000. With no more funds available for the development of Cabrillo Beach, the first stage in its development came to an end.

Meanwhile, the public in growing numbers were discovering the beauty of location, the combination of surf and still-water bathing, the boating, and the numerous other advantages of this beach, and an increasing demand for further improvements was the result. In 1931, the citizens of Los Angeles voted a $1,000,000 bond issue to the Department of Playground and Recreation for the dual purpose of providing employment and obtaining needed recreational additions and improvements in all sections of the city. Out of this sum, the Department set aside $90,000 for the completion of Cabrillo Beach as a recreation center.

Started in the spring of 1931 and completed late in the following year, the new program of improvements provided many facilities necessary to the complete use and enjoyment of the beach. The most important unit constructed was a large, fine bathhouse building, providing every necessary bathhouse facility, and equipped with a recreation hall and auditorium for social events, a restaurant, solariums, arcades, and administration offices for the beach. Two stories and a tower in height, its Spanish architecture conforms with that of the Cabrillo boathouse and other structures at the beach.

A rough and winding road, the sole approach to the beach from the heights of a bluff overlooking the ocean, was replaced with a series of fine modern drives, which were continued onto the beach and up to a large parking area. The beach was further beautified by walks, lights, and landscaping features. Sea palms were planted, in harmony with other features of the beach, to help beautify the playground and to act as windbreaks.

Picnic tables, shaded by pergolas and protected from the wind by glass fences, were placed in the picnic area, surrounding a huge open-air fireplace and outdoor cooking facilities. Areas containing playground apparatus for children and sports equipment for adults were laid out and completed. In this way, Cabrillo Beach has been made into a playground where almost every known variety of seaside recreation can be enjoyed.

RAYMOND E. HOYT,
Superintendent, Department of Playground and Recreation.

Courtesy of Los Angeles Department of Playground and Recreation

CABRILLO BEACH, LOS ANGELES, CALIF.

(Upper) General view of beach, showing buildings, piers, and other improvements, harbor breakwater, and yachts and boats at anchor

(Lower) Modern bathhouse and general recreation building and portion of new drives and landscaping

Modern Structure Replaces Two Precinct Police Stations

BOSTON, MASS.—A fine new building to provide quarters for Divisions 4 and 5 of the Boston Police Department has been completed at the corner of Warren Avenue and Berkeley Street in the South End District of the city. This modern structure replaces the old precinct houses on East Dedham Street and LaGrange Street.

The cost of the new station house was $242,000. It is of brick and cast stone, three stories in height with basement to provide a garage for police wagons, cruising cars, and motorcycles. The first floor contains the booking desk and guard room with the police ambulance station in the rear. The second floor contains offices and bedrooms and the mezzanine floor provides space for a revolver range. The entire third floor is devoted to sleeping quarters for patrolmen with adjoining lockers and lavatories.

HARRY BELKNAP.

NEW DIVISION HEADQUARTERS, BOSTON POLICE DEPARTMENT

Effective "Modernize Your Home" Plan Stimulates Business and Employment

ELMIRA, N. Y.—The modernizing campaign that is being conducted in Elmira is already bringing results. It is based on an intelligent survey of the housing conditions. Instead of using the appeal of charity or unemployment in asking home owners to fix up their property, we show them that it is good business. There is a definite housing shortage of desirable properties. The big feature of the campaign, and the one that we are capitalizing on, is that two salesmen are employed to go out aggressively and sell the idea and bring in business. Another remarkable feature is that five of the local labor unions are paying so much a month for this sales effort, out of their treasuries.

A housing survey was conducted in October, 1932, with the assistance of the letter-carriers. Every vacancy in the city was reported, as to number of rooms, construction (frame, brick, stucco), type (single, double, apartment, flat, store), condition (modern, or not). Later, a group of about 175 people and concerns identified with the building industry were called to a meeting. From this group was organized the Building and Real Estate Division of the Elmira Association of Commerce, and a Chairman was elected, who appointed an Executive Committee. A committee of thirty—the most energetic and forceful men in the Building and Real Estate Division—were appointed to handle the financing of the campaign. A tentative budget was adopted. Solicitation was then made of all interested in the work, and subscriptions were obtained for a period of six months on a monthly basis.

The campaign was announced for January 1 to July 1, 1933, in a mimeographed pamphlet with an attractive cover headed "Making Old Houses into Charming Homes," in which the general results of the survey were stated and the organization of the campaign and its activities explained. Distinctive stationery, billheads, etc., are used by the Division, displaying the word "Modernize," and illustrating such activities with little marginal sketches.

Using the reported vacancies of the city, we proceeded to collect other pertinent information regarding each property, by personally visiting the vacancies and the houses in the neighborhood, and getting data from the Assessor's office, the City Chamberlain's office, and the Credit Rating Bureau. Each case was then passed on by a Credit Committee composed of five men who have no personal connection with the building industries, but who are identified with it—the manager of the Credit Rating Bureau, a Building and Loan executive, an architect, a real estate operator, and the Secretary of the Association. The two salesmen devote their entire time to soliciting such properties as the Credit Committee passes on favorably from the standpoints of credit, the possibility of the work's being undertaken, and the desirability of its being done, with respect to the surrounding property. Questionnaires presenting these facts, and filed in numerical sequence, are used by the salesmen as work sheets. Office cards are kept, filed according to street addresses, each card bearing the number of the corresponding questionnaire. A daily tickler record indicates the numbers of the work sheets that the salesmen are to follow up on certain days, and these work sheets, and the corresponding office cards showing progress of the cases, can be readily taken out of the files as needed.

The architectural firms in Elmira, as their contribution to the work, have offered to make the preliminary sketches and estimates required to inform people who are interested in any modernizing work. An agreement is entered into with any prospective client that if the sketch is used, the architect will be compensated.

Newspaper advertising on Wednesdays and Saturdays for three months is planned. It is also intended to modernize one half of an old house in the downtown district, given to the Division by Wesley O. Crew, of the Elmira Arms Co. There will be a visual contrast between the two halves of the property. One half will be furnished by a local store; bathroom and kitchen will be completely supplied with present-day equipment to make housekeeping convenient and attractive. A speaker's bureau of ten or more people will arrange for talks before as many organizations as possible on the subject of modernizing in all its phases, including decorating and furnishing.

Under the head of "Irons in the Fire" weekly bulletins are issued, stating the progress of the work, and itemizing some of the jobs under way: address of the property; owner's name and address; name of contractor; work being done. This special information is in such form that it can be cut out and put on cards in a 3 x 5 file, so that local concerns may circularize the prospects.

When the salesmen are working on any particular vacancy, they are required to examine every other property in the

HOME MODERNIZATION QUESTIONNAIRE

Address

Owner's Name Address

Employed by Working at Present?

Position Approximate Income $

Assessed Valuation Taxes

Are All Taxes Paid? Unpaid Taxes

Mortgages or Judgments:

Type	Amount	Held By	Date	Payments Made	Bal. Due

Local Credit Information Attached:

Satisfactory Doubtful Unsatisfactory

Age and Condition of Property:

Class A Class B Class C Class D

Type of Property:

2-story single Bungalow Double Upper Apt. Lower Apt.

Brick Frame Stucco

Would surrounding property be detrimental to modernization?

Property has been vacant since

General Exterior Conditions:

Does the general exterior appearance make the building attractive as a home? Yes No

If not, is it due to condition of repair , look of attractive or modern lines , improper exterior decorative features ?

Is it probable that exterior lines would have to be changed to give modern and attractive appearance? Yes No . To make into 2 apartments? Yes No

Should sidewalls be recovered with shingles, new siding, or other material, or would re-painting be sufficient?

What about apparent condition of roof? A B C . What kind of roof at present? Roll Asphalt Asbestos Slate Cedar Tile . Is modern type of entrance, more modern trim or more modern windows advisable to make an attractive exterior? Which?

QUESTIONNAIRE USED AS WORK SHEET

block and to report those that need paint, roofing, gutters, and exterior renovation. From this and other information, gathered as stated above, additional questionnaires are prepared as work sheets. The bulletins then report the properties that need attention and the reaction that the owners have shown to solicitations. Each house that is modernized is placarded with an emblem.

Each child in the schools has been given a pamphlet and two types of cards to take home. If the parents are owners, they will indicate on a card the attention their property needs and what they expect to do during the next two or three months; if they are tenants, they are asked to report by card, to the Association, the things that should be attended to. These cards are then used as a basis for further sales solicitation. Later, all the participating groups will be organized in an "Every Employee" campaign, during which prospective places will be visited and brought into contact with various building industries, thus supplementing the sales efforts of the Division.

OSCAR MONRAD,
Sales Manager, Building and Real Estate Division, Association of Commerce, Elmira, N. Y.

Reflectorized Roadside Maps Used in County Road System

KANSAS CITY, MO.—The completion by Jackson County, Missouri, of its ten-million-dollar program of highway construction brought to light the necessity of providing the motorist with information regarding routes of travel available for use.

All paved county routes were designated, using a system of route numbers and names. Markers, caution and warning signs, reflectorized where necessary, were placed on about 400 miles of road. Joint Board Standards of the Bureau of Public Roads were adhered to in all cases.

Road maps were distributed throughout the county to acquaint the local residents with the new routings.

As one of the objects of the extensive systems of county routes was to relieve congestion of state highways within the county, it became necessary to devise a means of informing motorists entering the county, by way of state routes, of the various county routes available for their use. To give this information, a reflectorized map board was constructed and placed at the intersection of U. S. Route No. 40 and Jackson County Route No. 24-E, this being the point at which west-bound traffic on U. S. No. 40 first connects with the county system.

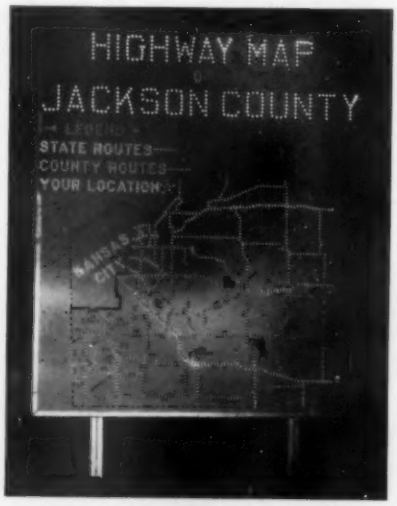
This map board, 10 x 12 feet in size, gives a complete map of the highway system within the limits of the county. State and U. S. routes are shown in black, reflectorized with crystal buttons. County routes are indicated in red, reflectorized with red buttons. The title and legend of the map are reflectorized with crystal buttons and a star indicating location of the map with reference to the system is reflectorized with green buttons. The map board, entirely of metal, rust-proofed, was installed at the edge of the widened intersection, and is visible

ERECTING HIGHWAY MAP

at night at a distance of 1,300 feet. As the driver approaches the intersection the title becomes fully legible and on entering the widening—at a distance of 650 feet from the map—the entire map is legible. If detailed route information is desired, the motorist may park on the pavement widening, to the right of the through traffic lane, and select the most advantageous route to his destination.

DAY VIEW

This reflectorized map board, by making highway information available both night and day, from the driver's seat, facilitates the use of less congested and more direct county routings by motorists, unfamiliar with the county, who otherwise would confine themselves to



MAP AS ILLUMINATED BY HEADLIGHTS

the use of state and Federal routes. It is the intention of the county to place similar maps at each entrance to the county on state and Federal routes.

The construction of Jackson County's highway system was financed by a bond issue in 1928 of $6,500,000 and an additional issue of $3,500,000 worth of bonds in 1931. A total of 310 miles of modern highways were built, 258 miles of which are paved with portland cement concrete, the rest of the mileage being retread surface on old macadam base.

The location, design and construction was under the direct supervision of E. M. Stayton and N. T. Veatch, Jr., functioning jointly as consulting engineers for the County Court.

Training the Guns on Accident, Fire and Carelessness

CANTON, OHIO.—How safety and fire prevention activities can be dramatized is well illustrated by the program which is being developed for an intensive county-wide Safety and Fire Prevention Campaign, to be sponsored and directed by the Canton, Ohio, Chamber of Commerce.

Last year, a similar campaign was climaxed by the largest safety and fire prevention rally ever held in Ohio. More than 5,000 men, women and children packed the Canton public auditorium to witness safety and fire prevention demonstrations and to hear an address by Thomas P. Kearns, Superintendent of the Division of Safety and Hygiene of the Industrial Commission of Ohio. This year the Chamber of Commerce will conduct two rallies to accommodate the crowds.

CITY DECLARES WAR ON PUBLIC ENEMIES; CHAMBER OF COMMERCE TO DIRECT BATTLE are the headlines on the lead story in *The Cantonian*, the official house-organ of the Canton Chamber of Commerce, in firing the opening gun of the warfare against "Canton's Public Enemies No. 1, 2 and 3." In this dramatization, the Chamber has succeeded in arousing a genuine hatred for "these three bandit-outlaws, known by name as Accident, Fire, and Carelessness," and a willingness on the part of the citizenship to do battle with them.

The article is of such nature as to be helpful to other American communities in their safety and fire prevention campaigns, and is with slight omissions, as follows:

SAFETY AND FIRE PREVENTION WEEK SCHEDULED TO BEGIN APRIL 2; PLANS NOW UNDER WAY

Relentless warfare will be waged during the next three months against Canton's Public Enemies No. 1, 2 and 3—and when the smoke of battle has cleared, the remains will be relegated, without ceremony, to Potters Field.

An army of more than one hundred men and women, under the leadership of Commander-in-Chief Lloyd A. Bletzer and re-enforced by our entire citizenship, has arrayed itself against these three public enemies, known by name as Accident, Fire, and Carelessness.

The battle will be directed by the Canton Chamber of Commerce and the army will have at its command every effective weapon known to modern warfare. State troops will be sent here from the Division of Safety and Hygiene of the Industrial Commission of Ohio.

Charge against these three bandit-outlaws is that they have been Canton's most dangerous and

vicious enemies. The trio has ruthlessly and without warning bound, robbed and killed large numbers of our citizens, many of them helpless women and children. Under cover of darkness, they steal into peaceful homes, burning, destroying, maiming, killing. Yet on other occassions, they attack their victims in broad daylight—on the streets and highways, in the school, church, office or factory.

In Stark County alone, during 1932, their victims numbered more than one hundred persons. Property which the three have wantonly destroyed during the same period has amounted in value to thousands of dollars. Accident, Fire, and Carelessness were responsible for 100,000 deaths in the United States during the past year. No one is immune from their treacherous assaults. In the twinkling of an eye homes of happy families have been broken and children have been made orphans as a result of their activities. In the wake of their tragic visits they leave nothing but endless pain and suffering, sorrow and sadness.

Elaborate battle preparations now are under way and new enlistments are being made daily in Canton's effort to free its citizens from the death-grip of the Public Enemies No. 1, 2 and 3. A heavy barrage of safety literature and publicity is being laid at present and the three months' campaign will be climaxed by an intensive seven-day drive scheduled for the week beginning Sunday, April 2, to be known as Safety Week.

Institutions and organizations that have responded to the call for volunteers already include the Canton Repository, Boy Scouts, Girl Scouts, Station WHBC, service clubs and civic organizations, the city administration, police and firemen, our local schools, the Canton Automobile Club, Parent-Teacher Associations, Junior Police, and Canton business and industrial concerns.

Eighty-eight industrial concerns have joined forces in an extensive one-month safety contest which is to be conducted during March. Preparations have been made for two great safety rallies to be held at the city auditorium during Safety Week. . . .

Safety and fire prevention work is one of the finest and most noble of civic endeavors. Every man, woman and child who shares the responsibilities of the Safety Week program is rendering his or her community one of the greatest services that any citizen may render. Safety Week and the campaign designed to safeguard the lives and property of our fellow citizens against Accident, Fire, and Carelessness constitute a great humanitarian movement.

DALLAS L. HOSTETLER,
Assistant Manager, The Canton Chamber of Commerce.

Efficient and Economical Fire and Police Alarm Service for Newton City Hall

FIRE and police department officials of Newton, Mass., have provided, at no expense to the city beyond a small initial investment, complete fire alarm, hold-up alarm and watchman supervisory service for their beautiful new City Hall and War Memorial, a photograph of which appeared on the front cover of THE AMERICAN CITY for December, 1932, with an architectural description at page 84.

In doing this, they have utilized their municipally owned Gamewell fire alarm and police signaling systems to provide a direct connection between the new building and fire and police headquarters. Capitalizing on the municipal signaling systems in this way, Fire Chief C. W. Randlett and Police Chief M. T. Hughes have given the taxpayers more efficient protection without rental expense and at a minimum of maintenance cost, instead of following the practice in other cities of dealing with private central-station supervisory companies which charge a heavy annual rental for an indirect protection.

This protection consists of a Dualarm fire alarm system and an auxiliary police signal system such as is used in hundreds of banks as a protection against hold-ups. It includes the following Gamewell apparatus:

1 Master type fire-alarm box
4 Remote-control stations
1 6-inch H-C type vibrating bell
1 Dualarm control panel
1 Exemplar police box (street type)
1 Auxiliary police box
4 Floor type push buttons
1 Desk type push buttons

The Dualarm system provides a means for transmitting an alarm from various parts of the building directly to the municipal fire department through any one of the remote-control stations located at strategic points. The operation of a remote-control station automatically actuates the master type fire-alarm box on the outside of the building and also rings an alarm on the inside. An alarm may be transmitted also from the outside by operating the master box itself, should a passerby discover a fire in the property.

The auxiliary police signal system protects the tax collections and any other municipal funds in the city treasurer's office. Floor and desk type push buttons concealed at convenient points about the office make it possible to send a silent and instant alarm directly to police headquarters without being detected. Thus the police are given a chance to reach the scene before hold-up men could escape, yet without the danger to the employees that would be caused by a noisy type of alarm.

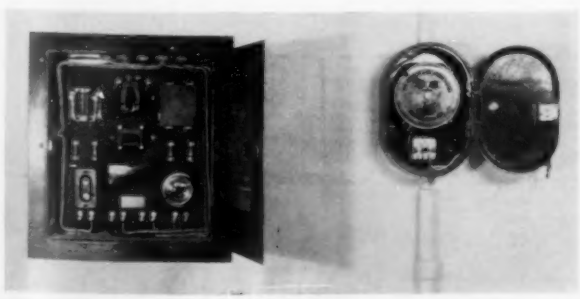
The Exemplar police signal box, located in a special booth near the telephone switchboard inside the entrance, furnishes the policeman who is constantly on duty in the City Hall during business hours with a means for sending in his on-duty calls without leaving the building. He can also receive telephone instructions from headquarters through this box or transmit emergency calls. At night this box is transformed into a watchman's signal box; the watchman is obliged to send in periodic on-duty signals through it to police headquarters.

Complete fire-alarm and police protection is furnished for this $850,000 structure by simply extending into it the facilities of the existing municipal fire-alarm and police signaling systems. The protection is complete, reliable and economical. No batteries whatever are needed, and the maintenance is expected to be almost nil.

FIRE AND POLICE ALARM DEVICES AT CITY HALL, NEWTON, MASS.

(Right) Fire Chief Randlett operating master type fire-alarm box at entrance to building

(Below) The city treasurer's office is connected directly with police headquarters through the Gamewell auxiliary police box (right), providing protection to tax collections and other municipal funds against hold-up. The Dualarm control panel (left) actuates the local fire-alarm bells automatically, as a warning to the building's occupants, when a remote-control station is operated



TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straets, I. S. Shattuck, P. J. Stupka, Donald M. McNeil

Origin and Destination Survey Aids Highway Planning in Monroe County, New York

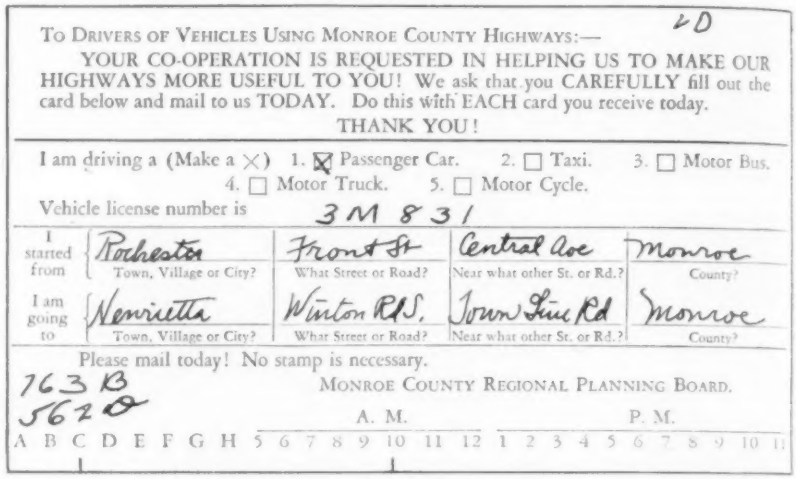
ACCORDING to Wilbur C. Slayton, Assistant Engineer of the Monroe County Regional Planning Board, the analysis of the Board's origin and destination survey has just been completed. The purpose of the survey was to ascertain the need for additional arterial highways to connect the city of Rochester, which is situated approximately in the center of the county, with the southeastern quadrant of the county. It was followed by a thorough analysis of the survey data, and studies were made of new routes which might be established as a result.

All the work, including field survey and office analysis, was accomplished by utilizing the services of the unemployed, furnished by the Monroe County Emergency Work Bureau under the supervision of the Planning Board staff. Although the tabulating could have been accomplished much more quickly by the use of machines, it seemed advisable to use the services of persons otherwise unemployed rather than rent such equipment.

PREPARATION FOR FIELD WORK

The data were collected by distributing 20,000 questionnaire return postal cards. The directions for answering questions, and the questions themselves, were made as simple and concise as possible, for it was felt that better returns would be obtained thereby.

Before taking the cards into the field for distribution, each one was marked at the bottom edge with symbols, so that it could be identified upon return as to the station and hour at which it was distributed. Each set was placed in a separate box marked according to the station and hour to be distributed.



TO DRIVERS OF VEHICLES USING MONROE COUNTY HIGHWAYS:— 20

YOUR CO-OPERATION IS REQUESTED IN HELPING US TO MAKE OUR HIGHWAYS MORE USEFUL TO YOU! We ask that you CAREFULLY fill out the card below and mail to us TODAY. Do this with EACH card you receive today.

THANK YOU!

I am driving a (Make a ×) 1. ☒ Passenger Car. 2. ☐ Taxi. 3. ☐ Motor Bus. 4. ☐ Motor Truck. 5. ☐ Motor Cycle.

Vehicle license number is 3M 831

	Town, Village or City?	What Street or Road?	Near what other St. or Rd.?	County?
I started from	Rochester	Front St	Central Ave	Monroe
I am going to	Henrietta	Winton Rd S.	Town Line Rd	Monroe

Please mail today! No stamp is necessary.

MONROE COUNTY REGIONAL PLANNING BOARD.

163 B
562 D

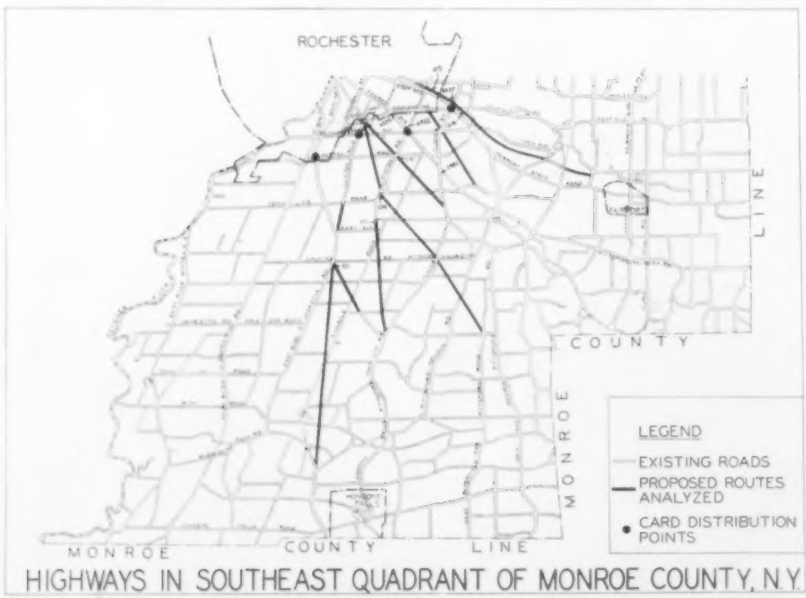
A. M. P. M.

A B C D E F G H 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11

SAMPLE POST CARD QUESTIONNAIRE

FIELD WORK

The points for distributing the cards in the field were established close to the city limits and in such a manner that a complete barrier was set up through which all vehicles must pass which traversed the area being studied. Four highway intersections or stations were selected for this purpose. Each station was split up into as many sub-stations as were necessary to intercept all vehicles passing through. A card was distributed to each vehicle passing through the station between 7:00 A.M. and 7:00 P.M. The day of distribution was a Thursday in May, selected because traffic records showed that traffic density would probably be light at that time, and therefore a smaller number of cards need be distributed. Proper correction was made later, in the office analysis for the season when the field work was done.



HIGHWAYS IN SOUTHEAST QUADRANT OF MONROE COUNTY, N.Y.

The numbers at certain points on the above map are the computed traffic densities from 7 A. M. to 7 P. M., some being on existing roads and some on proposed roads

OFFICE ANALYSIS

Of the 20,000 cards distributed, 29.5 per cent were filled out and mailed in. For the most part, the questions were intelligently answered, so that a proper analysis could be made.

The cards were first assembled according to the sub-station and hour of distribution. The percentage of cards returned to the total number of vehicles passing for each hour at each sub-station was then computed. These percentages were used later in computing the theoretical number of trips between origins and destinations.

A county highway map on a scale of 1 inch to a mile was then laid off in mile squares (hereafter known as blocks) and each block given a number. In cases where there was a congestion of roads in a block, such blocks were further divided into four half-mile squares for closer analysis. These squares were lettered A, B, C and D.

Each card returned was then marked according to the block of origin and block of destination. The cards for each

sub-station and hour of distribution were at all times kept separate.

The theoretical number of trips between the blocks for each hour through each station were tabulated on cards. These were then totaled with regard to the origin and destination blocks for each station for the 12 hours.

Next, the totals were combined, forming a grand total of the number of trips between blocks. The totals were arranged in numerical order as regards the block numbers, from the smaller numbers to the larger; that is, traffic between blocks 305 and 18 was recorded 18-305, etc.

The necessary information was now in order for the actual study of proposed new routes. A number of such routes were studied with various hook-ups and existing roads. Each route was laid out on the map and given a route number. The many combinations of trips between blocks as already recorded were each tried on the route being studied, and were credited to that route if properly belonging to it—the major test in each instance being that this route must afford the shortest distance possible.

The results obtained from this analysis are believed to be decidedly worth while. Facts were brought out which could not have been learned by any other method. One route which had been looked upon with favor before the analysis was found to be unnecessary. Owing to the success of this first venture with this type of traffic survey, it is probable that other areas may be analyzed in the same manner.

It is believed that the use of origin and destination studies will increase. It should be obvious that streets and highways cannot be intelligently laid out unless the demands for travel from one point to the other have been determined. Such surveys also help to show the necessity of intra-city and other routes. One study showed that 20 per cent of the motorists on the main street of a large city did not want to be there at all, but knew of no other route to take.

Equipment Versus Accident Costs

JUSTIFYING the erection of traffic equipment, in dollars and cents as well as in lives saved and accidents prevented, the Bureau of Traffic Planning of the city of Pittsburgh has recently shown that property damage accidents costing $716,000 occurred at locations where traffic equipment costing $63,500 had been recommended.

In a survey over a 58-month period at locations where it is planned to erect equipment already on hand at an installation cost of $15,000, it was found that property damage in accidents totaled approximately $500,000. In addition, 31 lives were taken and 694 persons reported injured in accidents at these locations.

The 1933 program of new equipment installation, budgeted at $48,500 for the purchase and installation of the equipment, calls for the adequate protection of locations where $216,000 property damage has resulted from accidents in a 58-month period. The accident record for these locations during the period considered was 12 deaths and 337 non-fatal injuries.

The placing of traffic equipment—lights, signs and paint markings—as an economy move is being stressed by the Bureau of Traffic Planning this year. It represents a more cogent argument to those who control the purse-strings than the mere recital of injuries and death.

Another fact revealed by studies of this type is the growing importance of erecting traffic equipment to prevent accidents, and not alone to expedite traffic.

Coordination of Street and Rail Traffic at Intersection

THE interesting and complicated problem presented by the intersection of two or more highways and an interurban electric railway has been successfully attacked in Los Angeles County, Calif. M. J. Bankhead, County Traffic Signal Engineer, has devised a novel solution for one of the most difficult of such situations. According to Mr. Bankhead, the conditions and the solution may be briefly outlined as follows:

The intersection (shown in the accompanying picture) is a nucleus of seven streets, all carrying two-way traffic, with a double track of the Pacific Electric Railway Co. crossing the intersection. Pedestrians are not frequent and therefore do not contribute to the complexity to any great extent. During an 11-hour count more than 13,000 vehicles entered the intersection, of which approximately 60 per cent made turning movements across the railroad tracks. Sixty interurban trains crossed the intersection during these 11 hours.

A wigwag was installed by the railway company to announce the approach of a train from either direction, but, because of the excessive time the wigwag operated, this only added to the confusion and delay that already existed.

In order to alleviate the condition the following method was adopted:

Automatic traffic signals were installed, utilizing the "far-corner set-up" of the three-light type of signal. The total cycle of 70 seconds was allotted to three distinct traffic movements, the various movements receiving 50, 25 and 25 per cent, respectively, of the total time cycle. The three movements were arranged in a sequence that would give the maximum natural clearance at the change of the signal from green to red, thus reducing the necessary time of the green-amber clearance signal.

The traffic signals were then interlocked with the railway track circuits in such a manner that upon the approach of a train from either direction the traffic signals display an "all-red" signal to all vehicular traffic approaching the intersection. At the same time the railway signal changes from a normal red, or "Stop," to a green, or "Proceed." This all-red signal is displayed ten seconds before the train arrives, giving ample clearance time to any vehicles that may be in the intersection at that time.

A time-element relay was introduced into the track circuit to provide a maximum time that the trains are allowed to hold the traffic signals all-red. This time is at present 20 seconds. If an approaching train does not arrive at the intersection within this 20 seconds after it has entered the "block," the traffic signals are released from the all-red position and operated in the normal manner. Simultaneously with the releasing of the all-red traffic signal, the train signals return to normal and the train is obliged to operate under control of the automatic traffic signals. This interlock is in operation 24 hours a day, thus giving protection at the crossing night and day.

The loading platforms for passengers were moved from the near side of the crossing to the far side, so that the trains could proceed across the intersection and release the traffic signals before stopping.

The bell on the railroad signal was silenced, and upon approval of the California State Railroad Commission, the crossing signal will be removed entirely.

This method of control has proved so effective that the public does not realize there has been any such interlock made with the railroad. The numerous commendations by railway and public officials are indicative of the fine solution of this extremely difficult traffic condition.

A COMPLICATED TRAFFIC INTERSECTION IN LOS ANGELES COUNTY

How Shall We Deal with Delinquent Adolescents and Wandering Youths?

THE increasing number of youthful offenders, particularly those from 16 to 21 years old, is a profoundly disturbing problem the country over. Many cities have found not only that numerous crimes are committeed by boys in this age group, but that the offenses are frequently of the most serious types.

A special study of this situation as it occurs in New York City has been made by the Sub-Commission on Causes, of the New York State Crime Commission, and its report has recently been issued, under the title, "The Youthful Offender." It was compiled by Harry M. Shulman, director of research for the Sub-Commission, and is dedicated, in a foreword by Professor Raymond Moley, to William Lewis Butcher, its deceased Chairman. The other members are Jane M. Hoey, Assistant Director of the New York City Welfare Council, and Joseph A. McGinnies, Speaker of the New York State Assembly.

Although it is to be hoped that the conditions revealed by this report are not typical of many cities to the extent found, nevertheless the problem in some degree is so widespread that the findings of the New York study are of general importance.

Half of all arrests for auto thefts, more than 30 per cent of all burglaries, and 25 per cent of all robberies in New York City, in 1929 and 1930, were within this age group. Rape and other sex offenses were also frequent.

To Improve the Treatment of the Youthful Delinquent

The report sharply disapproves of the failure of legislatures to modernize the procedure of criminal justice for these young offenders, in view of the poor success of the existing criminal code as a deterrent to crime.

As a step toward wiser treatment of the youthful offender, the Sub-Commission recommends sharp curtailment of the powers of the adult criminal courts over youths, describing as "arbitrary and capricious" the sharp separation, at the age of 16, of children benefiting from the protection of the children's court, from those over 16, who are subject to the adult criminal courts.

Claims of physical violence by the police for the purpose of securing confessions; the actual fact of atrociously bad overcrowding and other physical and moral perils during the period of detention in city prisons and county jails; the tactics of criminal lawyers in coaching their young clients to plead first "not guilty" and later, "guilty," after a bargain had been struck with the court, all tend to the conclusion that the process of justice in New York City must have a bad psychological effect on the impressionable young offender. And New York is by no means the only city of which this may be said.

The Sub-Commission recommends modification of the criminal codes for the benefit of this age-group and the set-up of special courts for the hearing of cases of adolescents, under the jurisdiction of judges with special personal qualifications and social as well as legal training, assisted by trained probation staffs, supplemented by psychiatric and psychological services. It is pointed out that the judge can make a wise and just decision only on the basis of an entire picture of the offender's previous history, and not on the specific act which brought him before the court.

The Sub-Commission questions the capacity of law alone to act as a deterrent to the crimes of youth and urges the establishment of vocational, recreational and educational programs for prevention of crime among these boys and girls.

Boy Wanderers

With the long continuance of the depression and its increasing effects of privation and insecurity in millions of homes, another problem concerning youths of this age has developed, which affects not only the cities but the entire country. Boys in large number have left their homes, under stress of economic circumstances, and are bumming their way from city to city and state to state in search of work or at least sustenance.

A careful study of this situation has been made by the National Committee on Care of the Transient and Homeless, which represents the Association of Community Chests and Councils, the Family Welfare Association, The Child Welfare League, the Salvation Army, the National Urban League, the Y. M. C. A., the Y. W. C. A., the National Association of Travelers Aid Societies, and the Bureau of Jewish Social Research. The Committee considers the most reliable estimate of the entire transient group to be 1,250,000, of which 135,000 are boys under 21; 970,000 are men over 21; and 145,000 are women and girls. All three of these groups deserve more intelligent and humane consideration than has been accorded them.

Several plans have been proposed for dealing with the transient boys, prominent among these being that of Senator Couzens, who would set aside $22,000,000 for the care of boys of 15 to 21 years of age in citizens' military training camps. Contrasting with this a proposal of Senator Wagner, the Committee states:

"The provisions made for these boys in the Wagner bill which sets aside $15,000,000 by grants to states for care of unemployed transients is a more desirable provision than that made under the Couzens bill which suggests citizens' military training camps for their care.

"To put boys in military camps does not solve the problem of their future. The Senate's interest in homeless and transient boys in the nation has caused these two bills to pass with a total request for $37,000,000 in appropriations. It now is necessary for the House of Representatives to choose which of the two provisions for transient boys will best solve the problem."

This is both a community and a national problem. The locality cannot be expected to deal with it alone, nor is it possible or desirable to remove these boys entirely from community life to national military or other camps. Furthermore, there are continual accessions to the group. The Committee says:

"Communities must be helped to deal both with transient boys and with the increasing number of boys coming out of high schools and colleges with no chance for jobs.

"Boys should be studied and handled as individuals. They must be taken into the life of some community for any permanent solution of their difficulties.

"These boys are hoping to find a way to help lift the family load which they felt leaving home would lighten. To solve their problems of food and shelter in camps at the expense of the possibility of their helping out at home would thwart their main motive."

All this involves intelligent community planning for both prevention and rehabilitation.

Forest Service Rather Than Army Camps

Another suggestion that would help to meet the problem in part, in a more wholesome and constructive manner than recourse to military camps, is put forward by the American Forestry Association. It is pointed out that the 150,000,000 acres of National Forest, in 38 states, provide opportunities for a vast amount of socially useful and physically beneficial work, and that forest camps could be established by the national forest service in a great many sections of the country, which could absorb enough of the able-bodied youth to make the problem of dealing with the remainder easier for the states and communities. Secretary Hyde of the Department of Agriculture is given as the authority for the statement that work to be done in the national forests would normally employ 100,000 men for a year; less important projects would employ an additional 40,000. Secretary Ovid Butler of the Association remarks:

"A half-dozen demonstration camps in various parts of the country would quickly demonstrate the soundness and effectiveness of the program. The Emergency Relief and Construction Act of 1932 appropriated $5,000,000 for forest work in the National Forests to relieve unemployment. It is understood that not all of this money has been used, in which case the government could establish demonstration camps without delay."

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Zoning—Board of Appeals

DISTRICT OF COLUMBIA.—*United States ex rel. Connor v. District of Columbia*, 61 Fed. 2d, 1015 (Court of Appeals, November 21, 1932).—After an adverse decision of the Board of Commissioners of the District, the applicants bring this action of mandamus to reverse it without availing themselves of the right given them by law, to appeal from that adverse decision to the Zoning Commission of the District. *Held*, that they must exhaust the remedy given by the law before they can bring mandamus in the courts.

EDITOR'S NOTE: It does not seem to be the law that in all cases the applicant, given the right of resort to a board of appeals from its adverse decision, must exhaust these remedies before taking court action, but only in cases where the regulation is substantially related to the public health, safety and general welfare; in which case he must go to the board of appeals (and appeal from its decision if adverse) to show that his situation creates an exception to a valid rule. *Nectow v. City of Cambridge*, 277 U. S. 183 (1928); *Dowsey v. Village of Kensington*, 257 N. Y. 221, 177 N. E. 427 (1931); see *Hodgkock v. People ex rel. Reed*, 13 Pac. 2d, 264 (Colorado).

Streets—Encroachments

ILLINOIS.—*People ex rel. Lapice v. Wolper*, 183 N. E. 451 (Supreme Court, December 9, 1932).—Mandamus to compel the removal of two curb gasoline pumps maintained, under ordinance and license from the city, by Wolper, for private gain, in a public street. Such a nuisance may be abated notwithstanding space is left for the passage of the public; and any individual may complain where special injury is done him. It was argued that the demand for gasoline and the convenience of obtaining it at the curb show a public interest in maintaining these pumps. Such a use, however, is not public or quasi-public, but for private gain.

EDITOR'S NOTE: Permits for encroachments on sidewalks and other parts of the highway for the profit or convenience of private parties are often issued. These encroachments are sometimes of durable construction, but their removal may be ordered at any time without compensation.

Undertaking Establishments—Residential Districts

MARYLAND.—*Jack Lewis, Inc., v. Mayor and City Council of Baltimore* (Court of Appeals), reported in *Baltimore Daily Record*, January 25, 1933.—Under the zoning ordinance of the city, the exclusion of funeral establishments from residential districts is a reasonable exercise of the police power.

EDITOR'S NOTE: In a large number of cities in this country many undertaking establishments will be found in residential districts, an old residence being often chosen for the purpose. As a rule, these establishments were so located prior to the enactment of the zoning ordinance for the city, and remain as non-conforming uses, these ordinances excluding them in future from such districts. The pressure of the undertaking profession to obtain admission to residential districts is persistent, for many patrons prefer to patronize such an establishment in a residential rather than in a business district. Often undertakers try to obtain a variance from the board of appeals to secure admission to such a district. But the neighboring property owners strongly object to such a use near them, and uniformly the courts have refused to sanction it, stressing the depressing effect of such a neighbor, especially upon women and children.

Parks

MICHIGAN.—*Briggs v. City of Grand Rapids*, 245 N. W. 555 (Supreme Court, December 6, 1932).—Where there is no clause in the deed conveying property to the city which it has acquired for park purposes to the effect that if not used for such purposes it shall revert to the grantor or his representatives, the statement in the deed that it was conveyed to the city for such purposes is not sufficient to cause the property to revert if the property is not so used. Property owners in the vicinity have no legal right which is violated in case land so acquired is converted to some other use.

EDITOR'S NOTE: In deciding the question whether a municipality, having acquired property for use for a given purpose, can abandon that use and devote it to another, the first thing to ascertain is whether the city has obtained the full and exclusive right to the land. This case holds, in accordance with established legal principles with regard to the interpretation of its language of deeds, that the statement of intention to make a certain use of land is not sufficient to give the grantor the right to retake the land if put to another use, the actual giving of that right in that event being necessary for that purpose.

A similar question may arise when a municipality takes land by condemnation, some statutes giving the municipality only the power to take so much of the title as is necessary for the given use, leaving a reverter in the former owner if not so used, other statutes—usually the more recent ones—vesting the entire title in the municipality. Usually, also, for a city to put park land to another use, the permission of the state legislature is needed.

Whether neighboring property owners as such may insist that a park use continue depends entirely upon whether a grantor, in deeding the land to the city has given them that right. A common way of doing so is to make such a park a part of the plat upon which the city and the neighbors obtain their property. This case decides that the mere fact that it is neighboring property does not give the owners of it any such right.

Zoning Ordinance—Repeal

NEW YORK.—*Leach v. Kenyon* (Supreme Court, Suffolk County), reported in *New York Law Journal*, January 17, 1933.—Where a later statute covers the whole subject of an earlier one, embraces new provisions plainly showing that it was intended not only as a substitute for the earlier act but to cover the whole subject then being considered by the legislature and to prescribe the only rules in respect thereto, it will operate as a repeal of the former statute relating to such subject matter, even if such former statute is not in all respects repugnant to the new statute.

Zoning—Public Property

NEW YORK.—*O'Brien v. Town of Greenburgh* (Supreme Court, Westchester County), reported in *Westchester Law Journal*, January 31, 1933.—The plaintiffs seek to enjoin the construction and operation by the town of an incinerator plant for the disposal of garbage on property purchased by the town for that purpose, located in a zoning district in which such a use is forbidden. The plant has not yet been constructed, and hence is not a nuisance; nor does the evidence sustain the proposition that it will necessarily be a nuisance when constructed. *Held* that the zoning ordinances of the town did not prevent it from constructing the incinerator.

EDITOR'S NOTE: Zoning ordinances do not, as a rule, by their terms seek to bind public authorities, and it is difficult to see how they could do so effectively. Often these authorities, in deference to public opinion, conform to these ordinances, and sometimes, when desiring to locate contrary to their provisions literally interpreted, seek a variance from the board of appeals authorizing such a location, but they would not seem to be compelled to do so. The cases on this subject are few in number. In the opinion the case of *Kublack v. McGuire*, 199 Cal. is cited. See also *People v. Seims* (County Court, Nassau County, New York, 1932); *Village of Larchmont v. Town of Mamaroneck*, 239 N. Y. 551, 147 N. E. 191 (1924); *City of Cincinnati v. Wegehoft*, 162 N. E. 389 (Ohio, 1928).

Enforcement of Zoning Ordinance by Individuals

An editorial on this subject, citing the New York cases, may be found in the *Westchester Law Journal* of February 2, 1933.

The Municipal Bond Market

THE following is a representative list of recent sales of new issues of local bonds, taken from current numbers of *The Bond Buyer*:

Amount	City, County, etc.	Rate (%)	Term (Years)	Basis (%)
$ 250,000	Radnor Township, Pa.	3½	17 1/3 (avg.)	3.30
569,126	Utica, N. Y.	3.40	4.77 (avg.)	3.36
1,088,000	Bethlehem, Pa.	3.69 (avg.)	8½ (avg.)	3.64
171,000	California	4	21 1/3 (avg.)	3.83
1,959,000	Columbus, Ohio	4.48 (avg.)	9.62 (avg.)	4.26
170,000	Des Moines, Iowa, School District	4½	13.43 (avg.)	4.42
188,324	Des Moines, Iowa	4½	10 1/6 (avg.)	4.48
100,000	Woodbury County, Iowa	4¾	6½ (avg.)	4.57
162,000	Vanderburgh County, Ind.	4¾	5½ (avg.)	4.74
250,000	Walworth County, Wis.	5	6½ (avg.)	4.82
375,000	Bexley, Ohio, School District	5¼	10 1/6 (avg.)	5.25
500,000	St. Clair County, Ill.	5	3-12 (ser.)	5.65
175,000	Morgan City, La.	6	8 (avg.)	6.00
500,000	Cambridge, Mass.	3.36 (avg.)	10¼ (avg.)	6.48

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Abutters' Rights

City, not acting arbitrarily, held not liable for depreciating rental value of abutting property by maintaining "No parking" signs (North Carolina Supreme Court: *Thompson v. City of Reidsville*, 166 S. E. 389).

Accidents

City held not liable for injury to electric department patron who fell on steps, not because of governmental immunity, but because not negligent (Massachusetts Supreme Judicial Court: *Kelmel v. City of Holyoke*, 182 N. E. 861).

If city neglected street lighting undertaken by it and injury resulted to pedestrian, city may be held liable (South Dakota Supreme Court: *Hermandson v. City of Canton*, 244 N. W. 525).

City may be held liable for drowning in municipal swimming pool due to neglect of attendants (Kansas City, Mo., Court of Appeals: *Thayer v. City of St. Joseph*, 54 S. W. 2d, 442).

City held not liable for collision by automobile with traffic post in street intersection, post being properly constructed and lighted (North Carolina Supreme Court: *Valley v. City of Gastonia*, 166 S. E. 791).

City held not liable for automobile striking fire hydrant posts when nearby electric light went out (New York Supreme Court, Appellate Division: *Morse v. City of New York*, 260 N. Y. S. 7).

City held liable for injury to pedestrian who stepped on defective watermeter lid (Georgia Court of Appeals: *City of Atlanta v. Hawkins*, 166 S. E. 262).

Pedestrian ignoring safer course for one known to be defective could not recover against city for resulting injuries (Pennsylvania Supreme Court: *Kacynski v. City of Pittsburgh*, 163 Atl. 513).

Civil Service

Creation of position of workhouse chef and abolition of position of workhouse steward held not invalid as subterfuge to oust steward (Ohio Court of Appeals: *Dykstra v. State*, 181 N. E. 488).

Policeman's removal for conduct unbecoming officer held not subject to judicial review (Tennessee Supreme Court: *Taylor v. City of Memphis*, 51 S. W. 2d, 849).

Condemnation Proceedings

City condemning land for public market held to acquire fee title and entitle to change use to street purposes (New Jersey Court of Errors and Appeals: *Bentley v. City of Newark*, 158 Atl. 463; (*Carroll v. City of Newark*, 158 Atl. 485).

Licenses

Ordinance imposing $200 annual license tax against non-resident merchants held void as being unjustly discriminatory (Missouri Supreme Court: *Nafziger Baking Co. v. City of Salisbury*, 48 S. W. 2d, 563).

Ordinance empowering mayor to impose a license fee of from $5 to $100 per day against transient merchants, and to fix term of license, was void (Iowa Supreme Court: *City of Creston v. Mezvinsky*, 240 N. W. 676).

Municipal Busses

Village upheld in operation of bus service that, in part, served non-inhabitants (Ohio Court of Appeals: *Southwestern Bus Co. v. Village of North Olmsted*, 181 N. E. 491).

Important Legal Decisions

involving municipalities, as reported in this department during 1931, are indexed and classified in The Municipal Index for the year 1932. This reference list, commencing on page 127 of the 1932 Index, supplements similar lists appearing in the 1931, 1930 and 1929 volumes, while the 1928 Index contains a list covering 1924 to 1927, inclusive.

Officials' Liability

Evidence held to warrant personal judgment against city officials for negligence in permitting railroad crossing signal to remain in traveled portion of highway, resulting in automobile accident (California District Court of Appeal: *Black v. Southern Pacific Co.*, 12 Pac. 2d, 981).

Ordinances

Ordinance prescribing fixed penalty held violative of statute providing for minimum and maximum penalties (New Jersey Supreme Court: *Laforgia v. City of Hoboken*, 160 Atl. 502).

Public Buildings

Taxpayer held not entitled to enjoin boxing exhibition in public gymnasium (Ohio Court of Appeals: *Fischer v. City of Cleveland*, 181 N. E. 668).

Whether courthouse burned should be restored or replaced by a new building held discretionary with county commissioners (Minnesota Supreme Court: *Linster v. Luecke*, 243 N. W. 395).

Public Utilities

City held powerless to contribute funds to employ experts to appear at hearing of application of gas company to state commission to fix rates (Georgia Supreme Court: *Stuart v. City of Atlanta*, 163 S. E. 493).

Purchases

Park director held unempowered to bind city by purchase of animals for zoo, that being a function of the park board (Texas Court of Civil Appeals: *Horne Zoological Arena Co. v. City of Dallas*, 45 S. W. 2d, 714).

Referendum

Land purchase for public market held not "legislative" provision subject to referendum (Oregon Supreme Court: *Whitbeck v. Funk*, 12 Pac. 2d, 1019).

Rewards

City held without implied power to offer reward for capture of felon (United States Circuit Court of Appeals, Ninth Circuit: *City of Los Angeles v. Gurdane*, 59 Fed. 2d, 161).

Special Assessments

General taxpayers had no standing to compel village collector to account for fees deducted from special assessment collections (Illinois Supreme Court: *Dudick v. Baumann*, 181 N. E. 690).

Streets

As against abutters, city may narrow sidewalks to widen space for vehicular traffic (Kentucky Court of Appeals: *City of Covington v. Averbeck*, 50 S. W. 2d, 50).

City could compel removal of private switch track from street (Indiana Appellate Court: *City of Indianapolis v. Link Realty Co.*, 179 N. E. 574).

Sunday Amusements

Injunction against ordinance forbidding Sunday movies denied (Kentucky Court of Appeals: *Strand Amusement Co. v. City of Owensboro*, 47 S. W. 2d, 710).

Taxation

Land held by county for public use was not taxable by city (Massachusetts Supreme Judicial Court, *Middlesex County v. City of Waltham*, 180 N. E. 318).

Water Works

Municipality selling water is subject to rules governing water companies (New Jersey Supreme Court: *Austin v. Mayor and Common Council of Borough of Union Beach*, 160 Atl. 318).

Tax against property for water works held not invalid because property not served by mains (Missouri Supreme Court: *State v. Johnson*, 50 S. W. 2d, 121).

Workmen's Compensation

Irregular appointment of motorcycle policemen held to deprive him of status of city "employee" under Workmen's Compensation Act (Illinois Supreme Court: *City of Macomb v. Industrial Commission*, 181 N. E. 413).

MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

Water Purification

"Census of Municipal Water Purification Plants in the United States, 1930-1931," published under the sponsorship of the American Water Works Association, is a paper-covered book of 146 pages. The information in Section I was collected and prepared by Eugene A. Hardin, Designing Engineer, Department of Water Supply, Detroit, Mich., and covers the rapid sand plants of considerable size now operating in all cities of over 100,000 population in 1930, with an elaborate tabulation, and detailed notes, showing the features of design and operation of these plants. Section II was prepared by the Committee on Water Purification and Treatment of the Conference of State Sanitary Engineers (Chairman, H. W. Streeter, Sanitary Engineer, U. S. Public Health Service, Cincinnati, Ohio), and gives a census of water purification plants in continental United States in three general summary tables by states: purification systems other than simple chlorination; simple chlorination plants—both of these tables covering ownership, source of raw water, population, total rated capacity, and total plant output; and comparative data for 40 states, as obtained from Gillespie's 1924 census and from the present census, as of 1930. In appendices are given lists of individual water purification plants other than simple chlorination, and simple chlorination plants, in the various states arranged in alphabetical order. 50c. (Apply to the American Water Works Association, 29 W. 39th St., New York.)

Public Works Departments

Under the title, "Your City and Mine," a radio address delivered over station WGY, Schenectady, on January 28, 1933, by Alfred E. Roche, Commissioner of Public Works, Troy, N. Y., has been issued as an 8-page pamphlet. Troy was one of the cities selected by the Committee on Uniform Street and Sanitation Records in which to make a demonstration installation of the Committee's system of measuring and accounting for public works activities. It is stated that the Troy Department of Public Works has saved in the past three years over $123,000, which is due almost exclusively to sound accounting and budgeting and to an intimate knowledge, gained through this record system, of each operation entering into public works. (Apply to N. Y. State Conference of Mayors, City Hall, Albany, N. Y.)

Airports

The "Report of Committee on Airport Control," issued February 15, 1933, by the Aeronautics Branch of the U. S. Department of Commerce, embodies a nation-wide study of the problems involved in controlling aerial traffic at airports. Under the chairmanship of Harry H. Blee, the Department's Director of Aeronautic Development, the Committee was assisted by subcommittees organized in cooperation with the American Engineering Council in 28 cities throughout the United States. Among the topics discussed in technical detail are: progress of landing area design; types of landing areas; general signaling requirements; and radio, aural and visual means of conveying informations to aircraft for direction of traffic. Appendices give uniform rules for airports; a description of an air-traffic-control projector developed by the Aeronautics Branch, descriptions of typical smoke generators for wind indication; time studies of airport traffic at various airports and a list of subcommittees. 49 pp. (Apply to the Government Printing Office, Washington, D. C.)

Government

"Philadelphia's Government, 1932," compiled by the Philadelphia Bureau of Municipal Research, is the third revised edition of this reference work. An organization chart is included and the functions, numbers of employees, volume of work, revenues and costs of the various units of government are mentioned. Free. (Apply to the Bureau, 311 So. Juniper St., Philadelphia.)

Highway Transportation

In the February, 1933, issue of *Public Roads*, published by the Bureau of Public Roads of the U. S. Department of Agriculture, appears "A Survey of Highway Transportation in Michigan," which is a report of highway usage upon trunk line, county and township highways and upon city streets of Michigan during 1930 and 1931. The State Highway Department of Michigan cooperated with the Bureau in the survey, which included also "Motor Tourist Traffic in Michigan," also published in this number. The detailed study of city traffic is omitted from the report because of lack of space, although an Appendix gives the "Method of Determining Local Traffic in Michigan Cities." Maps and tables. 19 pp. *Public Roads* is $1.00 a year. (Apply to the Superintendent of Documents, Washington, D. C.)

Finance

Readings in Public Finance and Taxation.—By Mark Carter Mills and George W. Starr. The Macmillan Company, New York. 1932. 823 pp. $3.50 *from* THE AMERICAN CITY.

This excellent collection of discussions of current tax problems by competent scholars has been gleaned from reports, magazine articles and published volumes dealing with public finance. The authors have had as their purpose to bring together in one volume much of the material resulting from the unusual amount of scientific inquiry of the last few years. They have succeeded admirably and by their judicious selection of material from fifty authors have presented a volume which contains some small portion of distilled wisdom on almost any current problem of government finance. Specially to be recommended because of their present timely interest and the value of their exposition are the following readings: "State Control of Local Expenditures," by Wylie Kilpatrick; "The Effects of Tax Limitation upon Local Finance in Ohio, 1911-1922," by Raymond C. Atkinson; "Taxable Capacity and the National Income," by H. A. Silverman; "The Problem of Measuring the Tax Burden," by Robert Murray Haig; "The Operation of the General Property Tax," by Fairchild, Furniss and Buck; "The Classified Property Tax," by Roy G. Blakey; "State Income Taxes," by Roy G. Blakey; and "The General Sales Tax in the Fiscal System," by Alfred G. Buehler.

MABEL L. WALKER.

Public Welfare

A report of the Conference on the Maintenance of Welfare Standards, held Nov. 18-20, in Chicago, Ill., has been issued by the American Public Welfare Association in 24 mimeographed pages. The call for the Conference was issued by the Association, with the cooperation of the Public Administration Clearing House and the School of Social Service Administration of the University of Chicago. Four committee reports are presented: Adequacy of Relief; Administration of Relief; Financial Resources; Provisions for Transients and Non-Residents. (Apply to the Association, 850 E. 58th St., Chicago, Ill.)

Health

"Health Councils," by Howard W. Green, Secretary, Cleveland Health Council, is No. 12 of Miscellaneous Contributions on the Costs of Medical Care, issued by The Committee on the Costs of Medical Care, 910 Seventeenth St., N. W., Washington, D. C. 24 pp. Containing "A Selected Factual Bibliography of Studies on the Costs of Medical Care and Related Topics, May 1 to December 31, 1931." "The health council is a cooperative agency for coordination in the field of public health. It strives to procure the greatest possible efficiency and economy in the development and dispatch of public health work through a democratically-controlled coordination of the work of public health agencies." (Apply to the Committee.)

Public Works and Trade Recovery

The National Committee for Trade Recovery (330 W. 42nd St., New York) has for distribution typewritten copies of three radio speeches delivered over Station WOR on Jan. 29, 1933: "The Effect of Public Works in Promoting Trade Recovery," by Martin Dodge, representing the Banking and Industrial Committee of the Second Federal Reserve District; "Low-Cost Housing and Slum Clearance," by Stephen F. Voorhees, Gmelin & Walker, architects, New York; and "Public Works for the Relief of Unemployment," by John P. Hogan, Chairman, Public Works Committee, American Society of Civil Engineers. (Apply to the Committee.)

Municipal Utilities

Under the title, "Results of Municipal Lighting Plants—The Answer to the City's Financial Problems," C. F. Lambert, of the Burns & McDonnell Engineering Co., consulting engineers, has compiled a wealth of data, physical and financial, concerning 222 municipally owned electric light and power plants, large and small, scattered through 37 of the states. The data given include, in general, population, type and capacity of plant, maximum demand, value of system, debt, revenue by classes of service (with average rates per kilowatt-hour), operating expenses, gross and net profit, and the 1932 rate schedules. A tabular comparison of revenues from 50-kwh residential and 250-kwh commercial consumption per month, and averages for total generation, sales and city uses, is given for all the plants. 88 pp.

This booklet is a companion to that on Rates, Revenues and Results of Municipal Ownership of Water Works in the U. S., by R. E. McDonnell, of the same firm, which was reviewed in these columns in December. Either of these may be obtained for $1.00 from THE AMERICAN CITY.

City Planning

Planning Problems of Town, City and Region, presented at the Twenty-fourth National Conference on City Planning, held at Pittsburgh, Pa., November 14-16, 1932. Published for the Conference by Wm. F. Fell Co., Philadelphia, Pa. 1932. *VI* + 158 *pp. Price,* $3.00.

This volume includes fourteen papers on various situations, conditions, problems, and results of planning and housing, in the social and economic divisions of the field; and, under "Making Planning More Effective," four additional papers; with three others under "The Range of the Planning Field." All of this material is presented by authorities in the work.

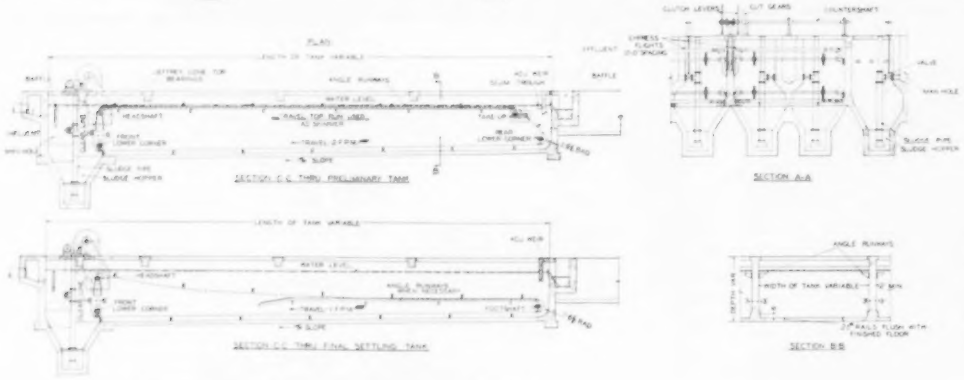
A Progress Report

"Five Years of Progress in Fort Worth" was issued Dec. 31, 1932, presenting, in 48 quarto pages, the final report on the Five-Year Work Program of the Fort Worth (Texas) Chamber of Commerce, embracing ten major objectives. Many photographs and well-displayed statements show how successfully the work has been carried out. (Apply to the Chamber.)

Recreation

The opening article in the January issue of *The Architectural Record* is: "Need for Recreational Buildings Foreseen by American Institute of Architects." It quotes from a report of the Committee on Industrial Relations of the Institute, of which William Orr Ludlow is Chairman. "The increase in leisure time will create a demand for the kind of building that leisure time will need," says the report. "We are going to turn our attention to parks, municipal and national, and to the building of swimming pools, outdoor gymnasiums and country hotels . . . Architects, engineers, city planners, landscape architects, builders, park boards and public officials will do well to think a little in advance of the inevitable trend of affairs." 1 p. (Apply to the magazine, 115 W. 40th St., New York.)

Sewage Disposal Equipment



Typical arrangement of Conveyor type of Sludge collecting mechanism for preliminary and final settling tanks.

by JEFFREY . . . . .

With a developing consciousness of sanitary requirements the progressive American city is rapidly adopting material handling methods in the disposal of its sewage.

Some of the recent Jeffrey Sewage Plant installations include those in: Amherst, Ohio; Akron, Ohio; Orrville, Ohio; Lake Placid, N. Y.; Saranac Lake, N. Y.; Houston, Texas and others.

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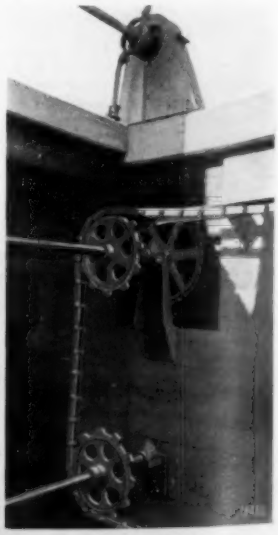
Bulletin No. 545 describes some of the proved equipments offered by Jeffrey; such as self-cleaning bar screens, grit conveyors, sludge collectors, shredders, etc. Send for it today.

Large view (below) shows Primary Tank (looking toward effluent end) with Conveyor acting as Sludge Collector and Skimmer. Small view shows Conveyor drive mechanism at influent end of tank.



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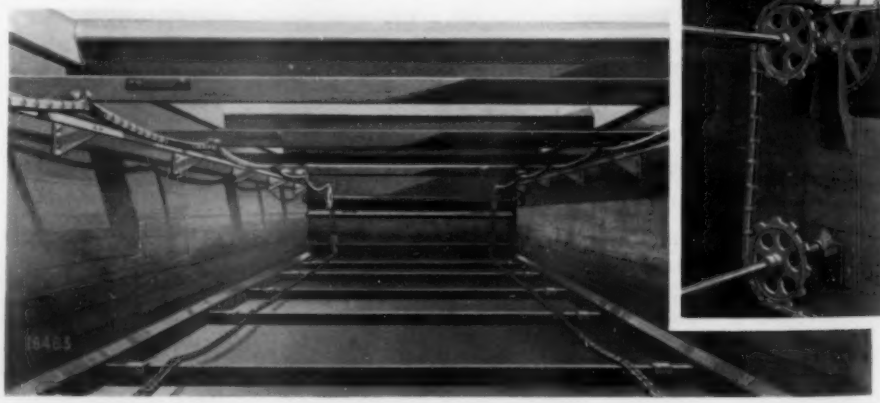


Highways

"Report of the Citizens' Road Committee to the Highway Engineers' Association of Missouri," January 26, 1933. A committee representative of various sections of the state and of organizations interested in road development was appointed by the President of the Association last April to undertake this study, and was organized to act without partisan bias. Reports are given of the sub-committees on State Highway Program, Scope and Progress; Farm-to-Market and County Roads; State Aid for Traffic Relief in Cities of over 2,500 Population; and License Fee Reduction. It is recommended that the entire county road system of any given county should be administered as a single unit, and that the same methods be used in developing county highways as are used in developing the state highway system: that a road plan for the county be prepared, a continuing road fund be established and then so programmed that a county highway system can be constructed and maintained which will meet the needs of that particular county. 35 pp., with photographs, folding maps, charts and tables. (Apply to the Secretary-Treasurer of the Association, Chas. H. Swift, Marshall, Mo.)

"Highway Fact Series 5," issued by the American Road Builders' Association, consists of five pamphlets of reproduced typewritten and illustrated material, setting forth attractively and emphatically the need for further highway construction and continued maintenance. The titles are: Why We Can Justify Our Highway Program; Highway and Street Construction as It Relates to Unemployment Relief; Federal Aid for Highways; The Gasoline Tax and the Highway Program; Highway Transportation. The Road Builders' Advisory Council is working to coordinate and intensify efforts to preserve the highway program, and has issued, besides these pamphlets, important typewritten circular letters to representatives of the highway field. (Apply to the Association, 938 National Press Bldg., Washington, D. C.)

Government

Among the general topics on the program of the annual meeting of the Governmental Research Association held in Buffalo in November, 1931, are the following: What's Wrong with Our Courts and Police?; Bureau Technique and Management; Survey Methods; Reducing Governmental Costs; Delinquent Tax Administration; Problems of Administrative Organizations; The Urban-Rural Conflict in Government; Technical Problems in Personnel Administration; and County Government. The Proceedings of this meeting is a 74-page quarto pamphlet. $2.50. (Apply to R. M. Paige, Sec.-Treas. of the Assn., 850 E. 58th St., Chicago, Ill.)

Salvage

Bulletin 112 of the Engineering Extension Service, Iowa State College, Ames, Iowa, is entitled "Practical Salvage Suggestions for the Fire Department." It is by Daniel H. Shire, Fire Chief, Mason City, Iowa, and Lindon J. Murphy, Municipal Engineer of the Engineering Extension Service, and is full of practical information about salvage methods. It explains the practices employed for minimizing damage, in the three stages of attacking the fire, during the fire, and after the fire, and describes salvage evolutions and equipment. 38 pp. (Apply to the Engineering Extension Service.)

Swimming Pools

The National Recreation Association has prepared a "Selected Bibliography on Swimming Pools, Baths, Bathing Beaches," listing books, pamphlets and bulletins as well as magazine articles and swimming pool equipment manufacturers. 3 mimeographed pp. 5c. (Apply to the Association, 315 Fourth Ave., New York.)

Water Supply

Two pamphlets by Howard E. Simpson, Water Geologist in Charge, Artesian Water Conservation Fund, North Dakota Geological Survey: "Methods of Reducing the Flow of Artesian Wells" (Artesian Water Paper No. 2, revised edition, 1924, 1932, 7 pp.; "The Ground Water of North Dakota" Paper No. 5, 1932, 26 pp.). Both illustrated. (Each sent free on receipt of request addressed to The State Water Geologist, University Station, Grand Forks, N. Dak., accompanied by 6c postage.)

Water Pollution

"Water Pollution Research: Summary of Current Literature." Vol. VI, No. 1, January, 1933. A collection of 120 abstracts of published material on water supplies; analysis and examinations of water; sewage; trade waste waters; pollution of natural waters, etc. The abstracts are published monthly, and are prepared by the Water Pollution Research staff of the Department of Scientific and Industrial Research, 16 Old Queen St., Westminster, S. W. 1, England. 36 pp. 2 shillings net; annual subscription 24 shillings, post free. (Apply to H. M. Stationery Office, Adastral House, Kingsway, London, W. C. 2, England.)

Housing

The International Housing Association (Hansa-Allee 27, Frankfort-on-the-Main, Germany) has published in Vol. IV, No. 5/6, of *Housing and Building*, much valuable, well-illustrated material, in German, English and French, on Housing in Vienna: (1) House Building by the City of Vienna and the Fundamentals of its Building Policy; (2) Financing and Rents; (3) Inspection and Management of Dwellings; (4) Housing Colonies in Vienna; (5) The Statistics of Municipal Undertakings. This number also contains an appreciation of Dr. Hans Kampffmeyer, General Secretary of the Association, who died on May 28, 1932. 80 pp. Price, 4.50 marks. (Apply to the Association.)

Local Government

The League of Minnesota Municipalities has published a 27-page preprint from *Minnesota Municipalities* for February and March, 1933, of "The Reorganization of Local Government in Minnesota," by William Anderson, of the Department of Political Science, University of Minnesota. The facts in the situation are given: the units of local government and the services they are expected to perform: the elective officers; the revenues and expenditures. Then the disturbing factors: a system devised for a frontier state; an overworked elective principle; inadequate administrative standards and methods; inequalities in ability to support services; many small and weak units; declining populations and valuations; high tax delinquency and heavy public debts. The remedies suggested in this study are entirely those of the author and involve the high points of a whole program of reconstruction to attain better service and economy. (Apply to the League, 15 University Library, Minneapolis, Minn.)

A "Survey of the Municipal Government of Indianapolis, Indiana," has been prepared by B. J. T. Jeup, C.E., formerly City Engineer of Indianapolis, whose close contact with the city departments for many years, and a broad experience in the solution of many of the city's engineering problems, have made it possible for him to make practical suggestions for materially reducing the city tax levy without impairing the efficiency of any department. Existing inconsistent municipal legislation affecting the city and its tax rate is set forth, and then proposals for reorganizing the city departments are given in detail, and suggestions for legislation tending toward the elimination of waste. 1932. 115 pp. (Apply to the author, 2415 N. Talbott Ave., Indianapolis, Ind.)

"A Working Plan for Local Government in West Virginia" is a 68-page pamphlet consisting of a memorandum pending a final report prepared at the request of the West Virginia Taxpayers Association, Charleston, W. Va., by the Bureau for Government Research, West Virginia University, and presented in part at the West Virginia Legislators Conference, December 2, 1932, at Charleston. It is Public Affairs Bulletin No. 6 issued January, 1933. The problem is analyzed under the divisions of county structure, local services, fiscal methods and budget control, and the remedies suggested are: a committee on simplification and economy; a county government amendment; the short ballot and the executive budget; a county unification plan: conjoint services and county consolidations; reallocating mandatory charges; and local budget control and state supervision. John F. Sly is Director of the Bureau. He says: "We have drawn freely on the experience of other states, on the precedents of our own, and particularly upon the work of the constitutional commission." (Apply to the Bureau, Morgantown, W. Va.)

Taxation

"Operation of Debt and Tax Rate Limits in the State of New York—A Study of the Constitutional Limitations and Their Effects Upon Municipal Finance," by Frank LeRoy Spangler, A.B., is Special Report No. 5 of the New York State Tax Commission, made under the auspices of the Commission and New York University. A suggested draft of a constitutional amendment in line with the author's recommendations is presented. 247 pp. (Apply to the Commission, Albany, N. Y.)

Metropolitan Regions

The Government of the Metropolitan Region of Chicago.—By Charles E. Merriam, Professor of Political Science, The University of Chicago; Spencer D. Parratt, Assistant Professor of Political Science, Syracuse University; Albert Lepawsky, Research Associate, The University of Chicago. The University of Chicago Press, Chicago, Ill. 1933. XXII + 193 pp. $2.00 from THE AMERICAN CITY.

In the Chicago Region—the area within a radius of 50 miles from the intersection of Madison and State Streets in the Loop—there are some 1,600 local governments having independent taxing and governing powers and some 7,700 elective officials. There are 204 city legislatures and sets of city executives; and 15 counties containing 165 townships. What can be done to reorganize the governmental activities of such an urban-rural section by simplifying lines of authority and responsibility? The present confusion and difficulties are explicitly displayed in this volume, and certain possible ways of governmental reconstruction are explained. Other cities that have similar problems will find this report of value.

Sanitation

"Beurteilung der Wasserverschmutzung mittels des Filterblätterverfahrens," by Dr. F. Sierp, Chefchemiker des Ruhrverbandes, Essen; Jahresbericht 1932, Ruhrverband; "Uber Hauskläranlagen und die Unachädlichmachung häuslichen Abwassers ausserhalb städtischer Entwässerungsanlagen," by Oberingenieur Franz Fries, Ruhrverband; "Uber die Berechnung des Regenabflusses," by Dr.-Ing. Mahr, Ruhrverband; "Leitsätze die Bearbeitung der Aufgabe: 'Die zulässige Belastung eines Gewässers durch Abwasser,'" by Dr.-Ing. Mahr. (Apply to Ruhrverband, Essen, Germany.)

Public Administration

The Public Administration Clearing House has compiled a valuable Directory of Organizations in the Field of Public Administration. Separate sections cover national, state, regional and Canadian organizations, including information as to number and type of membership, and secretariats; activities; affiliations; and publications. The national organizations are also classified by fields of activities. 205 pp. $1.00. (Apply to the Clearing House, 850 E. 58th St., Chicago, Ill.)

School Boards

"The efficiency of every school board member is of first importance." That this statement is well founded is shown in the January, 1933, Research Bulletin of the National Education Association, entitled "The School Board Member." The relations of board members to the board, to other board members, to employees of the board, and to the public; ethical principles for board members; the board as a corporation and its relation to the state and to the local government; the policies and activities of the board; and the educational, business and personal qualifications of board members—these are some of the important divisions of the discussion. 41 pp. Tables, figures, charts. 25c. (Apply to the Research Division of the Association, 1201 Sixteenth St., N. W., Washington, D. C.)

Other Reports Received

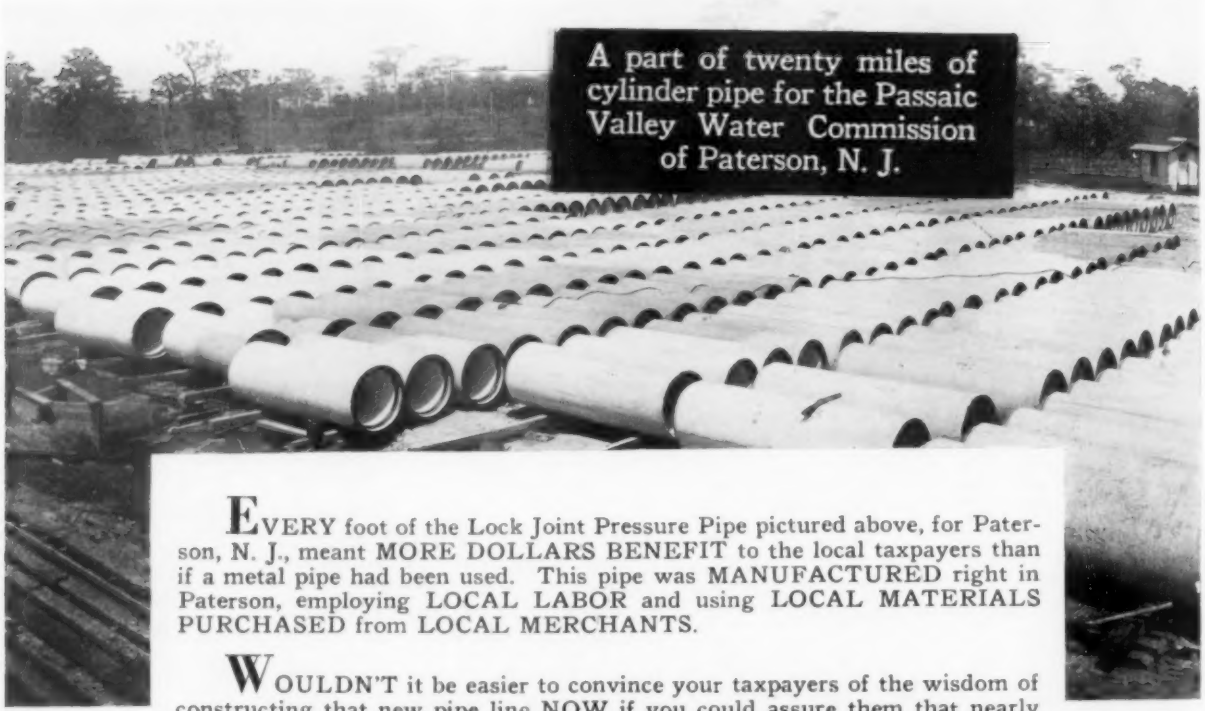
CONNECTICUT—Motor Vehicle Statistics for 1932. 32 pp.

PASADENA, CALIF.—Annual Report, Water Department, 1931-1932. 64 pp.

PHILADELPHIA, PA.—Men's Misdemeanants Division of the Municipal Court of Philadelphia. 1932. 181 pp.

PITTSBURGH, PA.—Pittsburgh's Traffic Accident Toll During the Year 1932. 8 pp. Mimeographed.

Acres of UNEMPLOYMENT Relief



A part of twenty miles of cylinder pipe for the Passaic Valley Water Commission of Paterson, N. J.

EVERY foot of the Lock Joint Pressure Pipe pictured above, for Paterson, N. J., meant MORE DOLLARS BENEFIT to the local taxpayers than if a metal pipe had been used. This pipe was MANUFACTURED right in Paterson, employing LOCAL LABOR and using LOCAL MATERIALS PURCHASED from LOCAL MERCHANTS.

WOULDN'T it be easier to convince your taxpayers of the wisdom of constructing that new pipe line NOW if you could assure them that nearly seventy-five per cent (75%) of the money to be spent would be a direct benefit to YOUR OWN COMMUNITY? Your taxpayers can be assured of such benefits by the use of LOCK JOINT REINFORCED CONCRETE PIPE which will be manufactured right in your own community.

THE extent of the local benefit from the manufacture of the pipe at Paterson is shown by these figures:

213 men employed locally in constructing the pipe
96 local firms benefitted by the purchase of materials

We shall be glad to supply further and more detailed information upon request.

Lock Joint Pipe Co., Ampere, N. J.
PRESSURE: SEWER: CULVERT: SUBAQUEOUS

Specify **LOCK JOINT** Specify
Reinforced Concrete
PRESSURE PIPE

Has ALWAYS Been GOOD—But It Is BETTER THAN EVER In These Days

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

MARCH 8—BOSTON, MASS.
American Water Works Association—New England Section. Annual meeting. Secretary-Treasurer, Roger W. Esty, Superintendent of Water Department, Danvers, Mass.

MARCH 8-9.—ATLANTIC CITY, N. J. (100)
New Jersey Mosquito Extermination Association. Annual convention. Secretary, Dr. Thomas J. Headlee, State Experiment Station, New Brunswick, N. J.

MARCH 22-24.—OTTAWA, ONT. (300)
American Water Works Association—Canadian Section. Annual meeting. Secretary-Treasurer, Dr. A. E. Berry, Director of Sanitary Engineering, Province of Ontario, Parliament Buildings, Toronto 5, Ont.

MARCH 23-24.—TRENTON, N. J. (200)
New Jersey Sewage Works Association. Annual meeting. Secretary, John R. Downes, Bound Brook, N. J.

MARCH 28-29.—FORT WAYNE, IND. (175)
American Water Works Association—Indiana Section. Annual meeting. Secretary-Treasurer, C. K. Calvert, 1902 North New Jersey Street, Indianapolis, Ind.

APRIL 4-6.—ALBANY, GA. (250)
American Water Works Association—Southeastern Section. Annual meeting. Secretary-Treasurer, W. H. Weir, 4 Capitol Square, S. W., Atlanta, Ga.

APRIL 7-8.—PHILADELPHIA, PA. (250)
American Academy of Political and Social Science. Annual meeting. Secretary, J. P. Lichtenberger, 3457 Walnut Street, West Philadelphia, Pa.

APRIL 10-12.—GAINESVILLE, FLA. (120)
American Water Works Association—Florida Section. Annual meeting. Secretary, Louva G. Lenert, Chief Engineer, Florida State Board of Health, Jacksonville, Fla.

APRIL 10.—SCOTLAND NECK, N. C. (200)
Eastern Carolina Chamber of Commerce. Annual meeting. Secretary, N. G. Bartlett, Kinston, N. C.

APRIL 10.—NEW YORK. (350)
National Committee on Prisons and Prison Labor. Annual meeting. Secretary, Miss Julia K. Jaffray, 250 West 57th Street, New York.

APRIL 13-15.—GAINESVILLE, FLA. (150)
Florida Engineering Society. Annual meeting. Secretary, W. W. Fineran, Gainesville, Fla.

APRIL 21-22.—HAVRE, MONT. (50)
American Water Works Association—Montana Section. Annual meeting. Secretary, Herbert B. Foote, State Board of Health, Helena, Mont.

APRIL 23-25.—JACKSONVILLE, TEXAS. (5,000)
East Texas Chamber of Commerce. Annual convention. General Manager, Hubert M. Harrison, Longview, Texas.

APRIL 23-28.—STILLWATER, OKLA.
Oklahoma Water and Sewage Conference. Annual conference. Secretary-Treasurer, H. J. Darcy, State Sanitary Engineer, Oklahoma City, Okla.

APRIL 24-27.—WASHINGTON, D. C. (1,100)
American Red Cross. Annual convention. Secretary, Mabel T. Boardman, National Headquarters, Washington, D. C.

APRIL 24-25.—BOSTON, MASS. (500)
Massachusetts Safety Conference. Secretary, Lewis E. MacBrayne, 6 Beacon Street, Boston, Mass.

APRIL 24, WEEK OF.—WASHINGTON, D. C. (100)
National League of Women Voters. National meeting. Executive Secretary, Miss Beatrice H. Marsh, 532 17th Street, N. W., Washington, D. C.

APRIL 27-29.—RALEIGH, N. C. (85)
Southern Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, Charles Ketchum, Greensboro, N. C.

APRIL 29—MAY 1.—RALEIGH, N. C. (50)
North Carolina Commercial Secretaries' Association. Annual meeting. Secretary, Howard B. Branch, Chamber of Commerce, Raleigh, N. C.

MAY 2-5.—WASHINGTON, D. C.
Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, 1615 H Street, N. W., Washington, D. C.

MAY 4-5.—BALTIMORE, MD. (75)
Maryland-Delaware Water and Sewerage Association. Annual conference. Secretary, A. W. Blohm, 2411 North Charles Street, Baltimore, Md.

MAY 11-13.—BELLINGHAM, WASH. (115)
American Water Works Association—Pacific Northwest Section. Annual meeting. Secretary, Ernest C. Willard, 720 Corbett Building, Portland, Ore.

MAY 15-16.—ALBANY, GA. (500)
Association of County Commissioners of Georgia. Annual convention. Secretary-Treasurer, Fred Houser, 246 Spring Street, N. W., Atlanta, Ga.

MAY 16-19.—PITTSBURGH, PA. (250)
National Association of Public School Business Officials. Annual meeting. Secretary, John S. Mount, Inspector of Accounts, State Department of Public Instruction, Trenton, N. J.

MAY 17-18.—COLUMBUS, IND. (150)
Indiana Association of Chiefs of Police. Annual meeting. Secretary-Treasurer, A. G. Eversole, Sheriff, Lafayette, Ind.

MAY 24-26.—BEAR MOUNTAIN, N. Y.
National Conference on State Parks. Annual meeting. Executive Secretary, Herbert Evison, 905 Union Trust Building, Washington, D. C.

MAY 25.—NEW YORK. (100)
National Board of Fire Underwriters. Annual meeting. General Manager, W. E. Mallalieu, 85 John Street, New York.

MAY 29—JUNE 3.—VIENNA, AUSTRIA. (1,000)
International Chamber of Commerce. Biennial congress. Manager of the American Section, John P. Gregg, Connecticut Avenue and H Street, N. W., Washington, D. C.

MAY 29—JUNE 1.—MILWAUKEE, WIS. (400)
National Fire Protection Association. Annual meeting. Managing Director, Franklin H. Wentworth, 60 Batterymarch Street, Boston, Mass.

JUNE 8-10.—DETROIT, MICH. (300)
National Probation Association. Annual convention. General Secretary, Charles L. Chute, 450 Seventh Avenue, New York.

JUNE 11-17.—DETROIT, MICH. (4,500)
National Conference of Social Work and Affiliated Associations. Annual conference. General Secretary, Howard R. Knight, 82 North High Street, Columbus, Ohio.

JUNE 11-17.—DETROIT, MICH.
American Public Welfare Association. Annual conference held with National Conference of Social Work. Director, Frank Bane, 850 East 58th Street, Chicago, Ill.

JUNE 11-17.—DETROIT, MICH.
Association of Community Chests and Councils. Annual meeting held with the National Conference of Social Work. Executive Director, Allen T. Burns, 1815 Graybar Building, New York.

JUNE 12-14.—CHICAGO, ILL. (200)
American Association of Museums. Annual meeting. Director, Laurence Vail Coleman, Smithsonian Institute, Washington, D. C.

JUNE 12-16.—CHICAGO, ILL. (1,200)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

JUNE 12-14.—GALVESTON, TEXAS. (250)
City Marshals and Chiefs of Police Union of Texas. Annual convention. Secretary, George A. Smith, P. O. Box 299, Dallas, Texas.

JUNE 12-14.—TYLER, TEXAS. (100)
Texas Commercial Executives' Association. Annual convention. Secretary, Carl A. Blasig, Brady, Texas.

JUNE 13-15.—CINCINNATI, OHIO.
Municipal Finance Officers' Association of the United States and Canada. Annual meeting. Executive Director, Carl H. Chatters, 850 East 58th Street, Chicago, Ill.

JUNE 26-30.—CHICAGO, ILL.
American Institute of Electrical Engineers. Annual summer convention. Assistant National Secretary, H. H. Henline, 33 West 39th Street, New York.

JUNE 26-30.—CHICAGO, ILL.
American Society for Testing Materials. Annual meeting. Secretary-Treasurer, C. L. Warwick, 1315 Spruce Street, Philadelphia, Pa.

JULY 15-22.—STANFORD UNIVERSITY, CALIF.
Western School for Commercial Secretaries. Annual session. Manager, Leonard E. Read, 304 Merchants Exchange Building, San Francisco, Calif.

JULY 31—AUGUST 3.—CHICAGO, ILL. (700)
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

AUGUST 21-27.—SAILING FROM CLEVELAND TO CHICAGO. (600)
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Yonkers, N. Y.

SEPTEMBER 6-8.—WHITE MOUNTAINS, N. H. (500)
American Forestry Association. Annual meeting. Executive Secretary, Ovid Butler, 1727 K Street, N. W., Washington, D. C.

SEPTEMBER 7-8.—NEW YORK. (200)
National Shade Tree Conference. Annual convention. Secretary-Treasurer, Dr. Rush P. Marshall, Yale University, New Haven, Conn.

SEPTEMBER 7-9.—STATE COLLEGE, PA. (200)
Pennsylvania Water Works Operators' Association. Annual convention. Secretary-Treasurer, I. M. Glace, 506 South Office Building, State Capitol, Harrisburg, Pa.

SEPTEMBER 17-20.—CHICAGO, ILL.
American Institute of Park Executives and the American Park Society. Annual convention. Executive Secretary, William H. Walker, 224 Wakewa Avenue, South Bend, Ind.

SEPTEMBER 18-20.—CHICAGO, ILL.
International City Managers' Association. Annual convention. Executive Director, Clarence E. Ridley, 923 East 60th Street, Chicago, Ill.

SEPTEMBER 21-23.—MILWAUKEE, WIS.
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

SEPTEMBER 24-27.—NEW YORK.
National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, C. M. Anderson, Chamber of Commerce, Memphis, Tenn.

SEPTEMBER 26-29.—WILKES-BARRE, PA.
International Association of Municipal Electricians. Annual convention. Secretary, W. H. Harth, Columbia, S. C.

OCTOBER 2-6.—ATLANTIC CITY, N. J. (600)
National Recreation Association. Annual congress. Administrative Secretary, Thomas E. Rivers, 315 Fourth Avenue, New York.

OCTOBER 2-6.—CHICAGO, ILL. (3,000)
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 9-12.—INDIANAPOLIS, IND.
American Public Health Association. Annual meeting. Acting Executive Secretary, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

OCTOBER 16-19.—OKLAHOMA CITY, OKLA. (350)
Southwest Water Works Association. Annual convention. Secretary-Treasurer, Lewis A. Quigley, Fort Worth, Texas.

OCTOBER 20-24.—OAKLAND, CALIF.
American Water Works Association—California Section. Annual convention. Secretary-Treasurer, R. F. Brown, P. O. Box 506, Stockton, Calif.

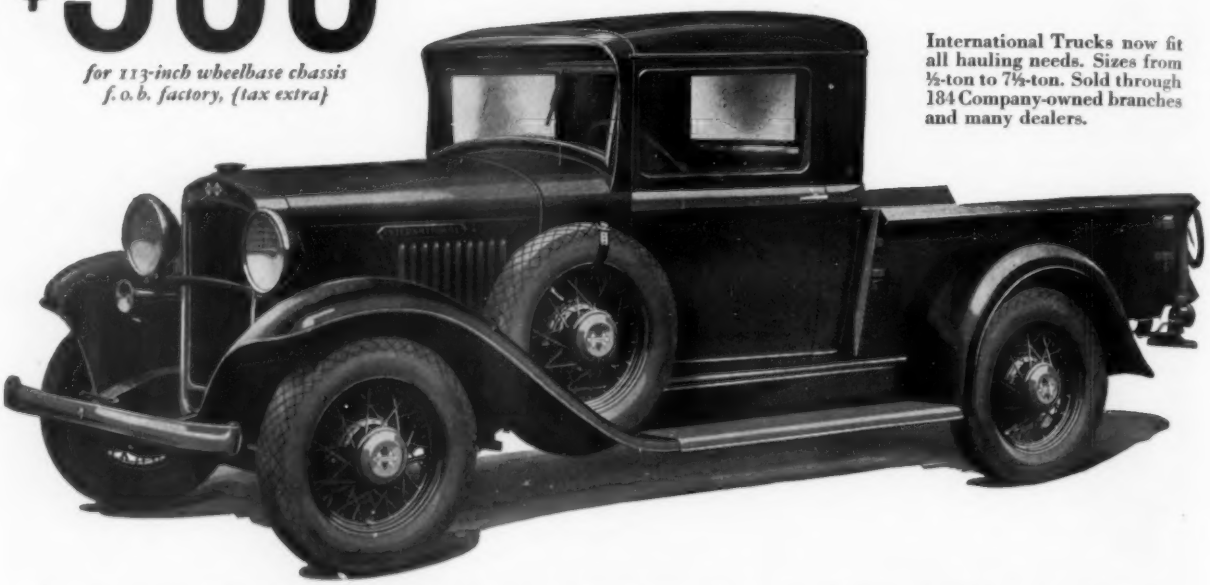
NOVEMBER 6-8.—STATESVILLE, N. C.
American Water Works Association—North Carolina Section. Annual meeting. Secretary, Professor H. G. Baity, University of North Carolina, Chapel Hill, N. C.

Now... an INTERNATIONAL Half-Ton 6-Cylinder Truck

for All-Around Light Hauling and Pick-Up Work

$360

for 113-inch wheelbase chassis f. o. b. factory, (tax extra)



International Trucks now fit all hauling needs. Sizes from ½-ton to 7½-ton. Sold through 184 Company-owned branches and many dealers.

Above: The International Model D-1, with coupe-type cab and all-steel pick-up body, which has loading space 66 inches long and 46¾ inches wide, side panels 11 inches high with 6-inch flareboards, four stake pockets, and drop endgate with covered chains.

« »

Rated Capacity: ½-ton.

Wheelbase: 113 inches.

Engine: 6-cylinder, L-head type, 3-5/16-inch bore x 4-1/8-inch stroke. Develops 70 horsepower. Exhaust valve seat inserts. Full pressure lubrication. Downdraft carburetion. Air cleaner.

Clutch: 9-inch single plate, with built-in vibration damper.

Rear Axle: Spiral-bevel gear type. Hotchkiss type final drive. Chrome molybdenum axle shafts, pressed steel housing. Tapered-roller differential and axle-shaft bearings.

Brakes: 4-wheel mechanical, 2-shoe type, self-energizing, internal-expanding and cable-controlled.

Springs: Semi-elliptic. All leaves of chrome-vanadium steel. Self-adjusting spring shackles.

Wire Wheels: 40-spoke, 18-inch with 5.25-18 balloon tires.

Standard Equipment includes trumpet horn, spare wire wheel, fender well tire carrier, front and rear fenders, and full-length running boards. All instruments attractively grouped in panel on dash.

THOUSANDS of truck users have long looked for a half-ton model from International Harvester. They have missed International *quality* in the low-price field.

For it is on *quality* that International Harvester built its outstanding success. Because of *quality* it has steadily increased its leadership among full-line truck manufacturers, greatly improving its relative position during the recent difficult years.

It has established this record on chassis prices never lower than six hundred dollars and ranging up to more than six thousand. High reputation, dependable performance, and unfailing service have brought new International buyers in increasing thousands.

Now new conditions have given us our opportunity. *Today* International provides another product of high quality in the new International Half-Ton Model D-1.

This new 6-cylinder truck at its remarkably low International price takes with it every guarantee that every International Truck carries. It is safeguarded by the nation-wide service that makes every International more valuable to its owner throughout the years of its life.

You are cordially invited to visit any International Branch or dealer and see this new half-ton International.

INTERNATIONAL HARVESTER COMPANY
606 So. Michigan Ave. OF AMERICA (Incorporated) Chicago, Illinois

INTERNATIONAL TRUCKS

NEWS AND ILLUSTRATIONS

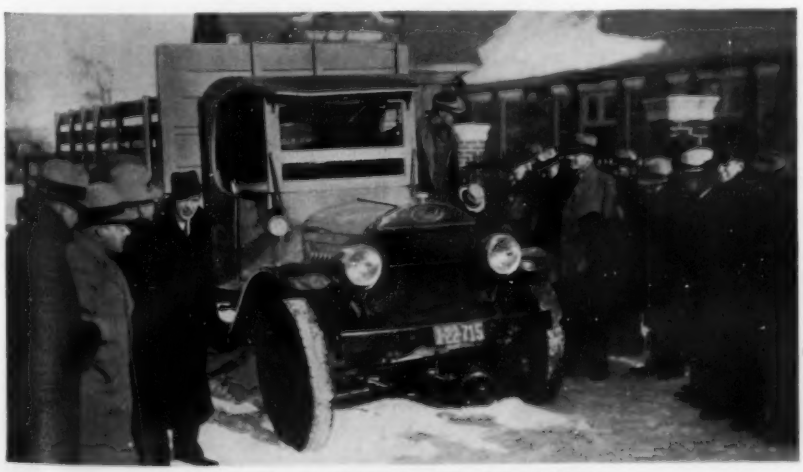
Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

New Test of Safety-Type Fire Hydrant

On December 16, 1932, a number of water-works superintendents and city engineers of Maine witnessed a collision test on a Kennedy Safetop fire hydrant in front of the Water District Shops at Portland, Maine. The test was arranged by representatives of The Kennedy Valve Manufacturing Co., Elmira, N. Y., as part of the program of the Maine Water Utilities Association Convention.

The Safetop hydrant had previously been installed in the street and was connected to the city supply main with 80 pounds water pressure. A truck was hired to crash into the hydrant so as to duplicate as closely as possible the conditions of an actual accident of this nature. The truck struck the hydrant at a speed of about 15 miles per hour, and many of the witnesses immediately scattered, anticipating the disastrous wreck and flood which frequently accompany an accident of this nature. But nothing of the sort happened. When the heavy truck crashed into the hydrant, the patented safety breakable section parted cleanly, releasing the upper standpipe section of the hydrant, which was carried along by the truck axle until the truck could be stopped. There was no loss of water, the driver was merely jarred, and the only damage to the truck was a bent bumper.

After the truck was backed away, the hydrant was examined, and the upper standpipe section assembly, carrying the nozzles and upper stem section, was found to be entirely uninjured. The inlet valve was being held snugly against its seat by the water pressure in the main, so that there was no tendency to flooding, nor was it necessary to shut off the water pressure while awaiting or during the repair. After examination of the hydrant had been completed, a Kennedy representative proceeded to make the necessary repairs. A new standpipe breaking ring with gasket, and a new stem coupling, were the only parts which were required for replacements, and the witnessing superintendents and engineers watched while one man, working with standard tools, made the hydrant ready for service again in 26 minutes, in spite of the fact that it was a bitter cold day, which made the castings difficult to handle. When the hydrant was again operated after the repairs had been completed, it was found to function perfectly.

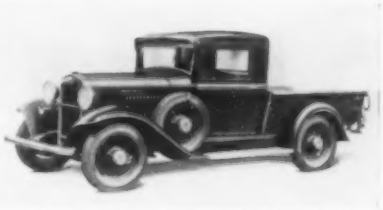


THE HYDRANT TEST AT PORTLAND, MAINE

A New Half-Ton Truck for Municipal Service

A new International ½-ton motor truck has recently been announced by the International Harvester Co. of America, 606 South Michigan Avenue, Chicago, Ill. This new Model D-1 enlarges the line of Internationals, which now extends from a ½-ton to a 7½-ton heavy-duty unit in a variety of types. This model, with an all-steel pick-up body, is sturdy, speedy and economical for use on miscellaneous jobs around a contractor's camp, carrying tools, men, etc., on road jobs, or for the various odd jobs connected with road and street maintenance work.

The chassis of this model has a wheelbase of 113 inches and is powered by a 6-cylinder engine of modern high-compression design which develops 70 horsepower at 3,400 rpm. Features of the engine are down-draft carburetion and full pressure lubrication to the main, connecting rod and camshaft bearings. The 9-inch clutch is of the single-plate type with built-in vibration damper. The transmission has three speeds forward and reverse. The final drive is of the spiral-bevel gear type with semi-floating shafts. The semi-elliptical front and rear springs are of chrome-vanadium steel and have self-adjusting shackles. Forty-spoke 18-inch wire wheels, a left front fender well, spare wheel and spare wheel carrier are standard equipment. The pick-up body has a loading space 66 inches long and 46¾ inches wide. The side panels are 11 inches high with 6-inch flare boards.



THE NEW INTERNATIONAL ½-TON TRUCK

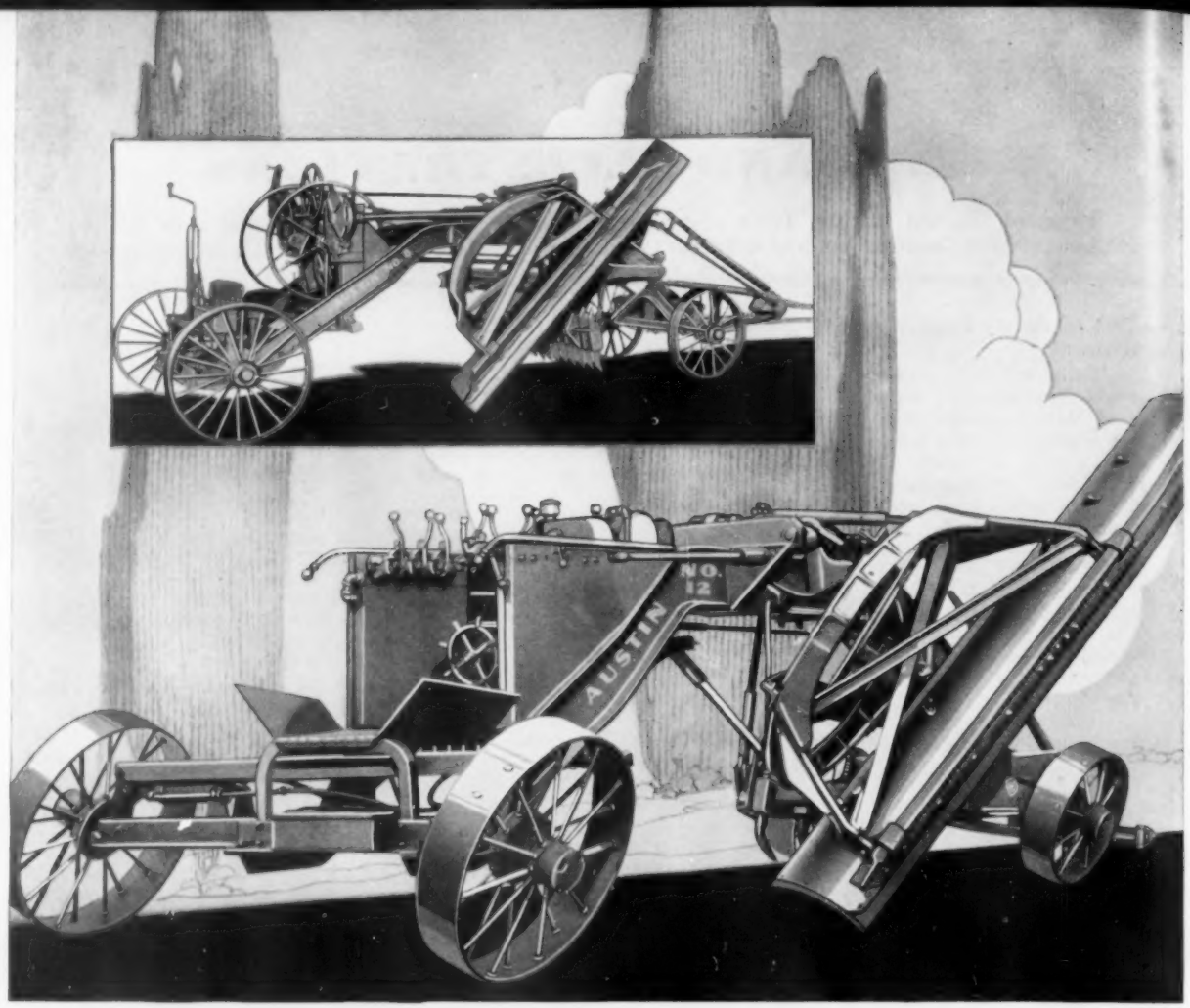
Waterproofing for New and Old Concrete

The major use of Stontite waterproofing, made by the Stonhard Co., 401 North Broad Street, Philadelphia, Pa., is for waterproofing, or damp-proofing concrete walls that have been erected and through defective construction or by expansion and contraction have open cracks or porous places permitting water or dampness to run or seep through the wall. In preparing the walls for waterproofing, the areas to be treated are thoroughly cleaned with a wire brush, or if there is any oil, grease or other foreign substance present, the surface is washed with a solution of Oakite or lye, taking care to use sufficient clean water after the cleaning to wash off any effects or deposits left from these cleansing materials.

Usually it will be found that the seepage water or dampness will supply sufficient moisture in the concrete, but should there be areas that are dry, it will be necessary to saturate them with water some time before the application. After the walls have been prepared in this manner, fresh, neat standard portland cement is mixed with Stontite waterproofing as it comes in the container, and the resultant mortar is applied to the cracks or porous areas through which the seepage is coming. This mortar will set in three to five minutes and seal off the water. Should the pressure be great, it may be necessary to hold or press the mortar with the trowel or hand to afford it the opportunity of properly setting up.

National Meter Co. Moves Offices to Brooklyn

On February 10, the National Meter Company moved its general offices to its plant at 4207 First Avenue, Brooklyn, N. Y., in the interest of greater efficiency in the conduct of its business. The post office address for the National Meter Co. is Bush Terminal Station, Brooklyn, N. Y.



New Austin Blade Graders . . . *with* HYDRAULIC Controls

UNDER every operating condition, from the deepest cuts of new construction to the light, precise work of road maintenance, greater standards of performance are set by the new 1933 Austin Road Graders offering HYDRAULIC CONTROL as optional equipment.

Better work because of smooth, accurate blade and scarifier adjustment...faster work because of instant response to controls—combine to mean lower cost per job or more accomplished per dollar of appropriation.

The new Austin No. 12 and No. 10 Road Graders carry to a still higher point the standards of reserve strength, extra capacity and extreme flexibility so well proven in the Austin No. 101 which they succeed. The Austin No. 8, patterned closely after the No. 12, offers in an 8-foot blade grader, every feature of the larger machines except hydraulic control.

Complete information about these New Graders and other New 1933 Austin-Western Road Machinery is now ready. Write today!

The Austin-Western Road Machinery Co., Home office 400 North Michigan Avenue, Chicago, Illinois. Branches in principal cities.

103

The Austin-Western ROAD MACHINERY CO.

ROAD ROLLERS, CRUSHING & SCREENING PLANTS, SCARIFIERS, SWEEPERS & SPRINKLERS, ROAD GRADERS, ELEVATING GRADERS. MOTOR GRADERS, PLOWS & SCRAPERS, BITUMINOUS DISTRIBUTORS DRAGS, SHOVELS & CRANES, DUMP WAGONS, SNOW PLOWS.

THE OUTDOOR EXHIBIT OF THE AUSTIN-WESTERN ROAD MACHINERY CO. AT THE ROAD SHOW IN DETROIT SUPPLEMENTED A LARGE SHOWING WITHIN THE AIRPORT

A New 2,200-Gallon Deep Well

An industrial well producing 2,200 gallons of water a minute under test was recently completed at the plant of the Piel Bros. Starch Co., Indianapolis, Ind., by the well development division of A. D. Cook, Inc., Lawrenceburg, Ind. The test flow was nearly three times the minimum guaranteed production of 800 gallons a minute.

The boring is 80 feet deep and takes water from a sand and gravel stratum about 20 feet thick. Fine sand in the water stratum impeded the flow of the water, and to get the required minimum output the Cook company removed some of the sand through concentric casings and substituted a 15-inch wall of selected and washed gravel to increase percolation. The gravel wall is held in place and water is admitted to the well by a special Cook strainer, 26 inches in diameter and 20 feet long.

According to the Cook company, this well and another which it completed for the city of Marion, Ind., are among the largest water producers in the Middle West.

Copper Water Services in El Paso

The city of El Paso, Texas, has taken advantage of the low price of copper, and its Water-Works Department is replacing the worn-out rustable service pipes with copper. Approximately 5,500 services, or a third of the total of 16,000, have been replaced. The Department recently purchased 40,000 feet of copper pipe for these replacements and it is expected that this will be enough for two years' supply.

A. H. Woods, Superintendent of the Department, says that his experience has shown that rustable service pipes will last only from two to fifteen years, depending upon the type of soil in which they are laid. He praises the lasting quality of copper, saying that in his opinion there need be no replacements for a century.

The superintendents of water works in numerous other cities have had the same experience as Mr. Woods, making the point that unless the proper metal is used, the service pipe suffers attack from two sides at once. If it is made of metal that will rust, the water attacks it from the inside. Soil corrosion and moisture seeping from the ground attack it from the outside.

The use of rustable service pipe has caused much complaint on the part of householder, who takes the stand that its failure causes discoloration of the water which they use, even though the plumbing within the house is rust-proof. The complaint goes still further when replacements are necessary, in that it is necessary to tear up and generally mutilate lawns and sidewalks.

The trend toward the use of copper water services by water-works departments in progressive cities has been marked in the last few years, according to the Copper & Brass Research Association, 25 Broadway, New York. Water-works departments in numerous cities have taken the view that replacements at this time are highly desirable, not only because of long-run savings, but because it affords an opportunity to give employment to those of their communities who have been without work during the depression.

A Self-Contained Sweeping Attachment for Trucks

A road and street sweeper which is a self-contained truck sweeping attachment for mounting on the front end of light-duty trucks has been announced by the Willett Manufacturing Co., Grand Rapids, Mich. The sweeper steers in the same radius with the truck, having couplings synchronized to the truck steering mechanism; hence it can be accurately and quickly guided around parked cars, and the rotating brush can clean the maximum area. All the controls for operating the Willett sweeper are mounted in the truck cab.

The sweeper is so designed that it can be attached to or detached from the truck in 15 or 20 minutes, once the original installation has been made. The 7-foot brush is mounted at an angle so that it sweeps a path 6 feet 6 inches wide. The sweeper is driven from a power take-off mounted on the right side of the truck transmission, the drive from the power take-off being transmitted by a short roller chain to a gear mounted on the end of the sweeper drive shaft, which is supported from the truck frame. The forward section of the sweeper drive shaft is constructed with a square sliding universal joint to compensate for uneven travel between the sweeper and the truck.

Hydraulic mechanism is installed for raising and lowering the rotating brush, which can be stopped and held in any position. The brush when raised clears the ground from 6 to 8 inches. The sweeper carries the weight of its own water tank, which is of sufficient capacity for 3 hours of normal sweeping, and it is particularly efficient for sweeping gravel roads free from dirt and dust prior to laying a permanent top coat of bituminous material.

Bingley Joins Chlorine Institute

W. McLean Bingley has recently been appointed Assistant Sanitary Engineer of The Chlorine Institute, Inc., 50 East 41st Street, New York. He is a graduate of Johns Hopkins University and was formerly in the employ of The Dorr Co.

THE NEW MODEL 85 WILLETT ROAD AND STREET SWEEPER

Sound Highway Policy

In 1931, the State Highway Department of Illinois initiated the practice of resurfacing failing pavements with brick.

Last year, Indiana was added to the list of states employing this method of salvage and improvement. Ohio has resurfaced with brick for years.

Resurfacing with brick is sound highway policy. It converts failures and incipient failures into the highest type pavement with its abnormally low upkeep.

When you resurface with brick, you fully salvage the value in an old road. It becomes a base, protected from further weather damage and traffic wear by the brick top. The subgrade remains undisturbed. You get a modern pavement, far better constructed than many of the brick pavements which are now giving upwards of thirty years of service at negligible upkeep costs.

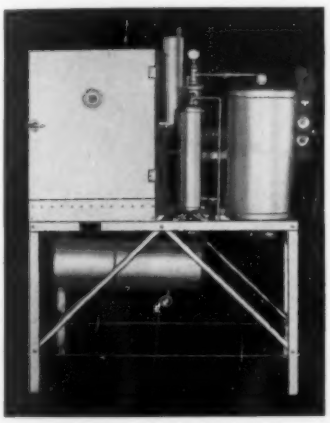
Brick resurface work may be carried out using various types of pavement for the base. We shall be glad to furnish information to those who desire it. Simply address National Paving Brick Association, 1245 National Press Building, Washington, D. C.

RESURFACE with BRICK

Reclaiming Crankcase Oil

Wherever fleets of ten or more trucks are operated, it is now economical to reclaim the oil by means of an automatic reclaimer. A large group of municipalities, counties and hauling contractors have installed oil reclaimers made by Skinner Motors, Inc., 2231 Dalzell Street, Detroit, Mich. The Midget Model has a capacity of 8½ gallons of drainage oil per working day, while the Junior Model has a capacity of 2 gallons of refined oil per hour and the Aviation Model 5 gallons of refined oil per hour.

The Midget Model, the smallest of these three oil reclaimers, does not require an expert to install or operate it. One of the garage men or mechanics is merely instructed how to use the machine, which is entirely automatic. The tank is filled with 8½ gallons of crankcase drainage, the electricity turned on and then left for five or six hours. At that time the temperature will normally be sufficiently high to open the filter relief valve. The reclaimer thereafter automatically completes the cycle of operations. When all the liquid contaminations have been driven from the oil, the electric heaters of the still shut off automatically. When the oil has cooled to the best temperature for correct filtration, the thermostatically controlled filter relief allows the oil to pass through the filter pads, thus removing all solid matter from the oil.



THE SKINNER SENIOR - AVIATION MODEL OIL RECLAIMER

The following morning, or whenever the machine is to be operated again, the filter relief valve is closed, and it is ready to reclaim another batch of oil. A new filter pad is installed as required. The majority of the diluent driven from the drainage oil during reclamation is collected by the machine and is used to distinct advantage as a penetrating oil for lubricating springs, etc. The reclaimer is furnished standard for either 110-volt, 220-volt A. C. or D. C. The complete requirements for its installation are 1½-inch galvanized pipe leading from the reclaimer to the outside of the building, and an electrical line. An empty oil drum, with slight alterations, is needed to collect the crankcase drainage oil.

A MODEL A-5 INTERNATIONAL MOTOR TRUCK EQUIPPED WITH AN ETNYRE OIL DISTRIBUTOR, OWNED BY THE DEPARTMENT OF HIGHWAYS, PROVINCE OF SASKATCHEWAN

The tank capacity is 800 U. S. gallons

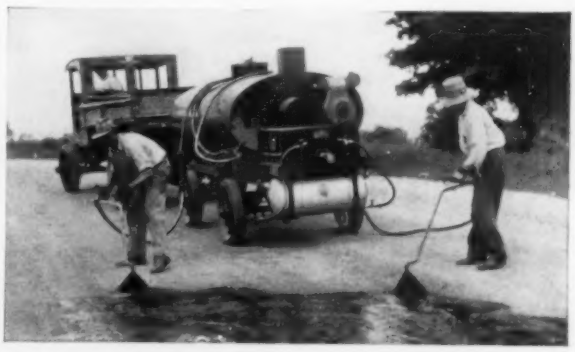
With electricity at 5 cents per kilowatt-hour, the cost of reclaiming oil with the Midget Model is 13 cents per gallon; with the Junior Model, 11 cents per gallon; and with the Aviation Model 8 cents per gallon. These charges include electric current, new filters and labor. According to lubrication experts, reclaimed oil passes every test of operating economy and is entirely as satisfactory as new oil. The reclaimed oil is about 80 per cent of the crankcase drainage.

A Utility Spray Tank

A trailer-mounted spray tank made in capacities from 600 to 1,200 gallons has been announced by Littleford Bros., 500 East Pearl Street, Cincinnati, Ohio, making available to highway departments and road contractors a desirable piece of equipment for patching, widening curves, relocating turns, repairing landslides and resurfacing ditches. It can be used for surface treatment and shoulder work economically over short stretches, thus replacing the larger and more expensive pressure distributor, and can also be used as a supply tank in conjunction with a pressure distributor.

The spraying unit consists of an air-cooled engine, a rotary gear pump, one 25-foot length of 1¼-inch flexible metal hose, and a spray bar. A double outlet can be installed to permit the use of two sprays. Wide spray bars with two or more spray tips can be furnished and are recommended when the outfit is to be used extensively for surface treatment. A special valve arrangement controls the flow of bitumen. The operator can regulate the valve to pump material from the tank car to the spray tank, and from the spray tank to kettles or distributors, or he can regulate the material through the tank. Asphalt, tar, road oil, cutback and emulsion are handled equally well.

Two sets of heat distributing flues, made of 5-inch pipe, pass from the rear to the front, and back to the rear of the tank. The tubes are properly supported to allow for expansion and contraction. Heat is generated by two LB torch-type oil burners which are fully protected from wind by a special windshield. Fuel is supplied to the burner under pressure from a 30-gallon fuel tank. An exhaust manifold covers the rear head of the tank and encloses the pump and piping, keeping these parts thawed out and in operating condition. The No. 101 tank is oval in shape, giving a low center of gravity. It is of welded construction with a steel baffle plate inside to reduce surging of the liquid bitumen. The tank may be purchased either mounted on a standard trailer or unmounted.



THE LITTLEFORD UTILITY SPRAY TANK IN ACTION WITH TWO SPRAY BARS ATTACHED

Kellogg of Mines Safety Appliances Company Dies

Edward H. Kellogg, for the past six years General Sales Manager of the Mine Safety Appliances Co., died on January 9 at his home in Pittsburgh, Pa. He became associated with the company in 1919, following the World War, having served overseas as a captain in the chemical warfare service. He was a member of the American Legion, the American Chemical Society, and the American Society of Safety Engineers.

Barrett Tarvia

GOOD ROADS at LOW COST

Seneca Trail, Mercer County, West Virginia. Tarvia "Re-Tread," 1930

The Barrett Company

New York	Chicago	Philadelphia
St. Louis	Minneapolis	Boston
Detroit	Cleveland	Hartford
Buffalo	Columbus	Milwaukee
Providence	Syracuse	Birmingham
Lebanon	Toledo	Cincinnati
Baltimore	Youngstown	Bethlehem
Rochester		Portland, Me.

THE BARRETT COMPANY, Ltd.
Montreal Toronto Winnipeg Vancouver

Highway officials, accustomed to buying road materials wholly on a competitive price basis, will do well to weigh carefully these factors:

Tarvia is manufactured in grades exactly suited to every highway requirement.

It must pass rigid specifications established by America's oldest and most experienced manufacturer of coal-tar, road-building materials.

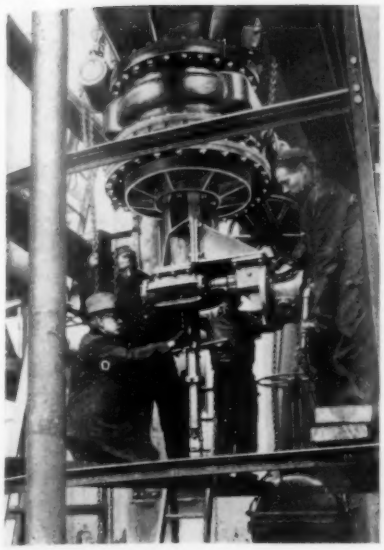
It is delivered by Barrett—when, how and as wanted.

It is applied from efficient Barrett distributors, by specially trained Barrett men under the supervision of expert Tarvia field men.

In brief, when you buy Tarvia you buy more than a road-building material—you buy *results*.

Talk it over with the Tarvia field man. A 'phone call, wire or post-card to our nearest office will put you in touch with him.

Mention THE AMERICAN CITY—it helps.



MAKING THE CUT WITH THE AID OF A COMPRESSED AIR MOTOR

Taps Made Under Full Pressure in Gas Main Line

In the midst of near-zero weather, in mid-December, two specially difficult tapping operations were undertaken at the plant of the Public Service Gas Co. of New Jersey, in Harrison, N. J., by The A. P. Smith Mfg. Co., of East Orange, N. J. These operations were very important because they were made under full gas pressure upon a 48-inch main through which the gas supply for the major population of northern New Jersey, in excess of a million people, flows.

The first of the two taps necessary for the installation of a by-pass was at a point 20 feet above ground, on the bottom of the pipe, requiring that the cutting be made vertically, upwards. The work first called for the welding in place, at the exact point where the first cut was to be made, of a steel hat-flange. Next, a special tapping valve was bolted thereto, permanently. To the valve a 30-inch Smith tapping machine was bolted temporarily.

With the gate of this tapping valve fully open, the cutting mechanism of the tapping machine was then advanced upwards until it came in contact with the wall of the main to be cut. This cutting mechanism is preceded by a drill of relatively small diameter, the functions of which are to furnish lubrication for the cutting which is to follow, to establish an outboard bearing for the tapping machine and to make it readily possible to withdraw the disc which is to be cut from the main.

Under air-motor power, it was an easy matter for an expert operator to make the actual cut in less than an hour, after which it was simple to lower the cutting mechanism to a point below the gate of the special tapping valve, to close the latter and to remove the tapping machine entirely. Of course, along with the cutting mechanism of the tapping machine came, too, the disc cut from the main's wall.

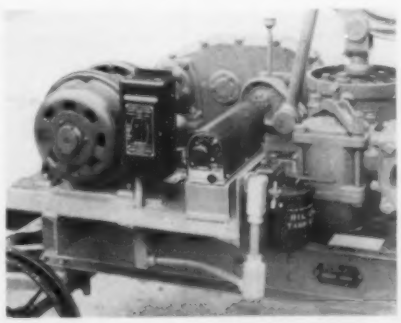
On the succeeding day another tap was made, also under full gas pressure, at a nearby point in the main. The gas company later easily connected these two points by a by-pass in which an automatic valve was installed, planned to shunt overloads of gas, as manufactured, directly into the large gas-holders instead of having them go, as usual, through certain intermediate operations in transit.

The use of air-power for this work proved to be particularly desirable. This is a relatively new adaptation by the A. P. Smith Mfg. Co. The older methods, calling for the use of either a steam or a gasoline engine for power, would have necessitated the building of a substantial foundation at considerable expense and at a loss of time. In that case, too, power belting would have had to be run up at the tapping machine, at the point of use, which could not have been adjusted nearly as easily as was the flexible air hose which carried the compressed air to the air-motor directly attached to the tapping machine. A compressor, at a considerable distance from the operation, did not present the fire or explosion danger which the open flame of a steam engine or the sparking of a gasoline engine would have meant in the midst of such gas-saturated atmosphere, with several mammoth gas holders directly adjacent.

Electrical Control Applied to a Portable Sludge Pump

To meet the unusual need of a large municipality for operating a portable sludge pump in outdoor service on either 220- or 440-volt electric current, the Chain Belt Co., Milwaukee, Wis., has made a unique application of electrical controls to one of its Rex sludge pumps. Merely turning one handle provides proper connection with overload protection for either voltage.

Three control units are used: a drum switch for proper re-connection of the motor leads; an overload circuit-breaking switch, and an oil-immersed safety power switch. The first two units are enclosed in the same housing as the motor, and their operating handles are accessible through the small door in the housing. The oil-immersed switch is mounted on the pump frame for "on-off" service. The motor has speed reduction gears built integrally with it, and further reduction is secured in another fully enclosed oil retaining gear case.



THE NEW G-E CONTROL PANEL OF THE REX SLUDGE PUMP

Destructive side-wall thrust is eliminated by means of the walking beam design; and efficient cylinder lubrication is secured through Rex "Sealed-in-Oil" plunger construction. These two features of design are responsible for the unusually long life of packing in Rex sludge pumps. Another novel feature of design is the Rex horizontal flap valves. These allow the full 4-inch diameter opening through the valve without obstruction, resulting in the passage of large solids without the clogging experienced in valves of other types.

Similar portable plunger sludge pumps are also available in single plunger design as well as models for permanent installation with either electric motor or gasoline engine drive.

The Calcium Chloride Association

The Calcium Chloride Association has been organized with offices at 4200 Penobscot Building, Detroit, Mich. Members of the Association include the Solvay Sales Corp., the Dow Chemical Co., the Michigan Alkali Co., and the Columbia Alkali Corp. Ray A. Giddings, Barberton, Ohio, formerly Manager of Special Product Sales for the Columbia Alkali Corp., and previous to that with the Minnesota States Highway Department, has been appointed Secretary and will supervise the Association activities, including advertising, research and the promotion of the various uses of calcium chloride. The Association succeeds the Calcium Chloride Publicity Committee, formed by the same interests in 1928 to promote the calcium chloride industry. N. W. Ayer & Son, Inc., Philadelphia, has been appointed advertising counsel for the Association.

Silent Substations

Electronic tubes, having no moving parts, have replaced larger and bulkier rotating machinery for rectifying alternating current into direct in a substation of the Edison Electric Illuminating Co., Boston. This is of particular interest to municipal power plants because its installation gives silent operation, high efficiency and economy in floor space. An outgrowth of the vacuum tube familiar in radio receiving sets, the capacity of the tubes for handling electric current is 100,000 times greater.

The installation referred to is in the Salem Street substation, in downtown Boston. The equipment, designed and built by the General Electric Co., Schenectady, N. Y., makes use of six Phanotron tubes. The electric energy from the power company's system enters the substation as 13,800-volt, three-phase, 60-cycle current, and is changed into direct current at 238 volts. The energy thus transformed is delivered to the distribution cables to supply residences, office buildings and stores. This rectifier equipment is applicable in connection with three-wire systems, and in other cases where it is desired to convert alternating to direct current.

Paved 32 years ago—and still good

Park Ave., Norfolk, Va., was paved in 1901 with Trinidad Lake Asphalt. It is in good condition after all these years—and good for many years more.

For great endurance and economy in upkeep

—pave with Trinidad Lake Asphalt.

Millions of square yards of Trinidad Lake Asphalt streets and roads throughout the United States and foreign countries are visible evidence of the exceptional service—the long life and low maintenance—they give. And we have an imposing mass of evidence to back their records.

Not only is Trinidad Lake Asphalt ideal for making out-and-out new pavements, but old rutty streets and dusty roads can be converted into smooth, dustless highways at minimum cost—for with present foundations of old concrete, brick, granite or wood-block a new road may be had for the price of an asphaltic top. A municipal liability changed to a decided asset, with marked economy!

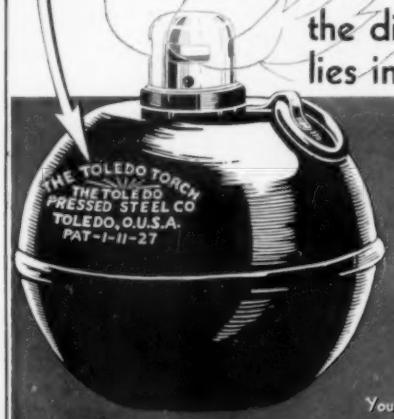
Write for information concerning the remarkable record of service given by Trinidad Lake Asphalt pavements.

THE BARBER ASPHALT COMPANY
Philadelphia
New York Chicago St. Louis

TRINIDAD
NATIVE LAKE
ASPHALT

this name on your torches means you have THE BEST

the difference lies in the burner



No other safety light can give you so dependable and economical protection . . . yet real TOLEDO TORCHES cost no more than the rest.

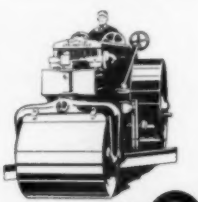
• • •

Your dealer can supply you.

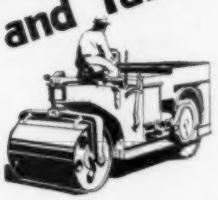
USE THE TOLEDO TORCH AND OTHER SIGNALS MEANS SAFETY

The Toledo Pressed Steel Co.
TOLEDO OHIO

Save with Steel



BUFFALO-SPRINGFIELD
Three Wheel and Tandem



BUFFALO-SPRINGFIELD'S complete range of models in both three-wheel and tandem rollers permits the purchaser to select a machine properly powered, speeded, and designed for his work.

THE
BUFFALO-SPRINGFIELD ROLLER COMPANY
SPRINGFIELD, OHIO

THE GALION CHIEF—A GAS-POWERED 3-WHEEL ROLLER

A New 3-Wheel Gas Roller with 6 mph Top Speed

The new Galion Chief 3-wheel gasoline roller is built to operate at a top speed of 6 miles per hour, which means less time lost in moving from place to place. It is equipped with a powerful 6-cylinder motor providing an abundance of power to meet all conditions. The motor is spring-mounted, which makes higher speeds practical without shock to the machine or strain on the power plant. The shorter wheelbase permits the roller to be turned around in less than 20 feet of space. Hydraulic steering gives quick, responsive control with practically no effort on the part of the operator. Only a slight movement of the steering wheel instantly adjusts the front roll to its full turning radius. The Galion Iron Works & Manufacturing Co., Galion, Ohio, makers of this roller, are well known for their other hydraulically controlled equipment, such as one-man power-operated graders.

The roller is equipped with a differential lock which permits the locking of both rear wheels together to prevent slippage. A powerful hydraulically operated scarifier permits scarifying and rolling in one operation. A sprinkler attachment mounted just forward of the center of each roll plays a powerful stream of water on all three rolls to overcome the pulling action when rolling sticky material such as hot-mix.

It is furnished with electric starter; electric lights are optional.

Eibell Leaves Worthington as Publicity Manager

F. C. Eibell, who for the past four years has been Manager of the Advertising and Publicity Department of the Worthington Pump and Machinery Corporation, New York, has resigned. He has had executive assignments on the staffs of three advertising agencies, two publishers and three manufacturers' advertising departments. No announcement has been made concerning his future plans.

Mohawk Asphalt Heater Co. Moves to New Quarters

The Mohawk Asphalt Heater Co., Schenectady, N. Y., has announced the removal of its factory and general offices to a new modern building at Frankfort, N. Y. This new up-to-date plant will house factory, warehouse, showrooms and offices under one roof. The factory permits straight line production methods for more economical production and for the addition of new lines as conditions improve and their need becomes apparent.

Addition to Staff of Industrial Chemical Sales Co.

Richard N. Statham has joined the staff of the Chicago office of the Industrial Sales Co., Inc., 230 Park Avenue, New York. Mr. Statham is a graduate of Dartmouth College and was employed at the company's laboratory at the Covington, Va., plant before becoming affiliated with the Chicago office. He is the son of Noel Statham, President of the Industrial Chemical Sales Co., Inc., who took out the patents covering the manufacture of the company's product, Nuchar, an activated carbon, and also covering Snow Top precipitated chalk.

An Airport Traffic Signal for Ground Control

The airport traffic signal provides a simple yet certain method for ground control of traffic at airports. The signal's unusually high candlepower and wide beam spread makes it legible from any part of the landing area for all taxi movements and take-offs.

The top lens of the signal is red, the center lens amber, and the lower lens green. When the signal is green, it indicates that the air is clear, and take-offs and taxi movements may proceed with safety. If the signal is amber, all ground movements may proceed, but only after each pilot has assured himself that his next movement can be made safely. When the signal is red, all ground movements must stop, each plane remaining in its position until amber or green again shows.

The base plate, housing, doors, and cap of the new airport traffic signal made by the Westinghouse Electrical Manufacturing Co., East Pittsburgh, Pa., are of cast silica aluminum alloy. The doors are provided with ventilating louvers, bug screens, safety chains, and non-losable wing screws. A graphited asbestos gasket mounted in the door channel and clamped against a raised flange on the body makes a weathertight joint. The cover on top of the signal is ventilated and can be removed.

The lenses are nine element Fresnel lenses, 240 mm in diameter, 177-degree segments, of pressed heat-resisting glass. Light shields are placed between the lenses to assure that only the color desired is visible.

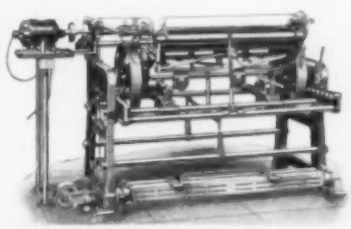
Three mogul screw sockets for 1,000-watt airway beacon or floodlight lamps are provided, one for each lens. The sockets are wide with No. 8 asbestos-covered cable protected by flexible steel conduit to a Micarta terminal block installed in the base. Peep sights and targets permit accurate focusing, and socket adjustments are so arranged that the light beam can be raised or lowered to meet local conditions.

A New Power Mower Sharpener Offers Auxiliary Service

A new mower sharpener called the Peerless Jr. has been announced by The Fate-Root-Heath Co., Plymouth, Ohio. This machine grinds all makes of power mowers and tractor units with blades up to and including 36 inches in width, as well as putting green and hand lawn mowers, without removing mower wheels or reel knives. It employs the well-known Peerless principle of *grinding* the blades with the proper clearance or bevel. It also grinds the reel knives to make a perfect contact with the straight blade or cutter bar, even though the latter is bent or sprung. It is very fast and accurate, quickly putting the mower reel back into first-rate operating condition.

The Peerless Jr. is equipped with a reconditioner, a device for revolving the reel knives backward while they are lapped in with grinding compound or emery paste. This method is used as the finishing process on putting green mowers and on other mowers with thin blades.

This machine is also equipped with an attachment bar for grinding straight blades when they have become too badly worn or "wavy" and uneven. The bar holds the straight blades so that both faces can be ground in one setting, by rotating the bar. This sharpener is also equipped with a special grinding wheel 8 inches in diameter and with a ¾-inch face with a steady rest mounted on the end of the main shaft, and is useful for grinding grass shears, hedge shears, sickles, scythes, axes and other edge tools.



THE NEW PEERLESS JR. MOWER SHARPENER

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Evanston, Ill., Installs New System of Street Lighting at Great Saving

By **HUGH E. YOUNG**
Consulting Engineer
Chicago, Ill.

SHERIDAN ROAD, EVANSTON, ILL., BEFORE AND AFTER NEW LIGHTING INSTALLATION

The lighting in the lower view is effected with G. E. Novalux Form 56 luminaires with Holophane B-Symetric dome refractors, mounted on Union Metal standards

EVANSTON, an Illinois municipality of 75,000 people, has just completed its new million-dollar street-lighting system. Approximately 5,000 ornamental street-lighting standards have been installed, placing this prominent suburb of Chicago in the leading class of well-lighted American cities. The efficacy of street illumination when carried out in accordance with recognized standards with respect to candlepower, mounting height and spacing of standards is well demonstrated in this new system.

The contrast with the older lighting systems in adjacent communities is quite noticeable. It emphasizes the advancement made in street lighting in recent years. Formerly Evanston had overhead lights suspended in the center of each street intersection, but now all thoroughfares in the city, which covers an area of about 7½ square miles, have been lighted, except for one or two small, undeveloped, outlying sections.

As a measure of efficiency, low maintenance, and economical operation, the street-lighting system, developed by Hugh E. Young and Co., is of the type which for lack of a better expression can be called "decentralized." Instead of having a centrally controlled substation, from which all the street-lighting circuits radiate, the Evanston system consists of twenty separately controlled substations called power centers, located at advantageous points throughout the city. Each power center is in an underground vault in which the electrical feed and control equipment are arranged in systematic groups. The control is full automatic, requiring practically no attention or adjustment.

Power is secured from twenty feed points of the Public Service Co. of Northern Illinois, the manholes belonging to the electric company being located alongside the city's underground power vaults. The city's power centers are fed three-phase 60-cycle 4,000 2,300 volts; the power consumed being metered at each vault. The drawings prepared for the city of Evanston by the consulting engineer definitely characterize each lamp in every circuit, and show them in position and electrical rotation, with their respective candlepowers. The unusual completeness of this system of numbering means the minimum amount of maintenance.

Electrical Equipment

The electrical equipment installed is of the latest design for series street lighting and more than meets all the requirements of the national electric associations. An automatic, astronomical time clock in each power center vault, adjusted to the seasonal variations in the time of sunrise and sunset, turns on all the lights in the 20- and 6.6-ampere circuits radiating out from that power center at dusk, and turns out certain circuits at midnight and the remainder at dawn.

There are 145 lighting circuits terminating in these 20 power centers. Each circuit has its own descriptive number, and every lighting standard in that circuit, and even every single light in the entire lighting system, has its own spe-

cific number. All equipment is designed for under-water operation in case the power centers become flooded, which is improbable, because each vault is equipped with a sump and an automatic pump of ample capacity. The automatic operation of the system should guarantee its continual functioning.

There are five classes of lighting standards, differing only as to height, except for the fourteen standards which illuminate Fountain Square, Evanston's central business district. These latter standards, in addition to being higher than the others, differ in that they are equipped with two luminaires instead of the single luminaire used throughout the rest of the lighting system. Standards on residential thoroughfares are located in staggered formation at intervals of approximately 150 feet, and the light center is 14 feet above the grade of the adjacent curb. Each luminaire contains a 250-candlepower, 2,500-lumen, 6.6-ampere incandescent lamp provided with an asymmetric, prismatic glass refractor, designed to redirect the light to the street surface and away from the adjacent residences. Boulevards and through streets are lighted with 400-candlepower lamps, mounted on 16-foot standards. The standards are spaced from 125 to 150 feet. The important business centers have 600- and 1,000-candlepower lamps mounted on 18- and 20-foot standards respectively. The central business district, Fountain Square, has standards with double luminaires, carried on ornamental brackets, each light being of 1,000 candlepower mounted 22½ feet above the curb. The city's former "street intersection" lighting system, as well as all private lighting standards in front of business places and elsewhere, have been removed, and the entire community now has a complete, decorative, harmonious, efficient lighting system at a record low cost and installed in record time by the Contracting and Material Co.

Designing the Standards

Because the city of Evanston is widely known for its cultural development, even more than ordinary attention was devoted to the design and ornamentation of the lighting standards, which, of course, is all that is visible of any street-lighting system. This was done in cooperation with the Evanston Art Commission, of which Thomas E. Tallmadge is Chairman. The standards are of combination cast iron and rolled metal, the bases decorated with a simple motif symbolizing the waves of Lake Michigan, upon which the city is situated, and a band of leaves, indicative of Evanston's beautiful tree-lined thoroughfares. The shaft is fluted, and an ornamental, octagonal lantern type luminaire is mounted on top of the post. All standards are on concrete foundations of varying dimensions corresponding to the several classes of posts.

A TWIN-LIGHT STANDARD ON AN EVANSTON BUSINESS STREET

The entire system was completed on November 15, 1932, inspected and tested by the consulting engineer's expert, E. H. Haug, and accepted with elation by the community; because not only was this million-dollar system designed, constructed and installed well within the engineer's estimate of cost, and with but a single extra, amounting to only one-half of one per cent, but the total cost was three-quarters of a million dollars less than the original amount the city of Evanston had expected to have to pay.

The new lighting project was carried out under the provisions of the Local Improvement Act. The major part of the installation comprised residential street lighting for which the property owners were assessed approximately $1.30 per lineal foot, which was the basic rate of assessment. On boulevards and business streets, the assessment per front foot ranges upward from the residential cost, depending on the candlepower used, the mounting height of standards and their spacing. The legal work involved in the special assessment proceeding was handled by C. H. Pendleton and his associate, Harry L. Fearing.

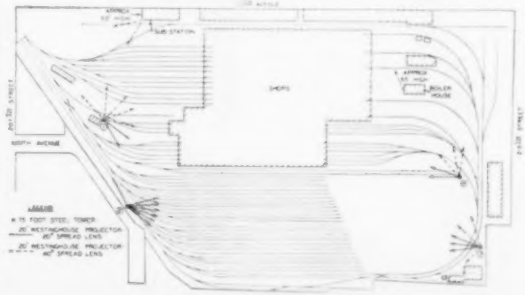
Credit for this important civic accomplishment is due Mayor Charles H. Bartlett of Evanston; Arthur W. Handford, President of the Board of Local Improvements; Alderman Albert J. Smith, Chairman, and Aldermen Clinton Merrick, H. S. Simpson, Rex Gay and R. E. James, members of the Street-Lighting Committee of Evanston's City Council.

Floodlighting New York's Municipal Subway Yard

THE storage yard of New York City's new Independent Subway System is provided with floodlighting equipment for safe and efficient handling of rolling stock at night. Thirteen miles of tracks in the yard can accommodate 500 cars.

Some of the projectors have 20 deg. and other 40 deg. spread lenses, giving an average lighting coverage of 0.1 lumens per square foot of lighted area. Narrow spread projection is used for long light throws and wide spread for short throws. Allowance for normal lamp depreciation and for accumulated dirt on lenses and reflector surfaces has been set at 20 per cent of initial light output.

Tower locations also aid light coverage over the yard. Projector banks on towers No. 2 and No. 3 (see plan) have their beams directed parallel to the tracks, providing a maximum amount of light between the rows of cars, and promoting safety.



PLAN AND NIGHT VIEW OF STORAGE YARD

Floodlighting is produced by 28 Westinghouse 1,000-watt CAG-20 projectors in banks of 5 and 7 units on top of four 75-foot structural-steel towers and on two of the buildings. Most of the light is concentrated on the tracks, but beams from several projectors augment supplementary lighting from 100 bracket lights around the shop buildings. Multiple circuits of 120 volts are used. Resistors in series with the lamps mounted on panel boards at the top of the towers nearest the transformer houses prevent over-voltage

Difficulties in Daytime Lighting of Underpasses

By KIRK M. REID and H. J. CHANNON
Nela Park Engineering Department, General Electric Co., Cleveland, Ohio

TYPICAL of the modern era is man's ever-growing desire to reduce the time required for travel. This desire has resulted in the breaking-down of physical barriers by the construction of tunnels or underpasses through hills and mountains and even under rivers. The underpass has also proved to be a successful method of reducing traffic congestion and thereby speeding up traffic flow in large cities. In many cases such underpasses permit only uni-directional traffic flow, which greatly increases the volume of traffic they can handle, and at the same time the collision hazard is materially reduced. Besides the constructional problems that have arisen with the advent of the underpass, the problem of effective lighting has reached major proportions, whether the underpass is only a few hundred feet or a mile in length.

The effective illumination of an underpass resolves itself into two problems—the day lighting and the night lighting. The night lighting problem is not a difficult one, since the level of illumination need not be much greater than that of good street lighting.

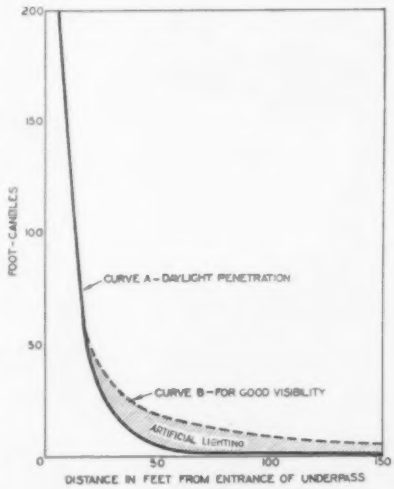
Contrasts in Lighting Intensity

During the daytime, however, there is a serious visibility problem at the entrance of an underpass. This is especially true of underpasses 200 feet or more in length where no benefit can be derived from the silhouette effect of the opposite opening. The difficulty arises from the sudden change in illumination level—from several thousand foot-candles outdoors to one foot-candle or less within the underpass.

To compensate for changes in illumination, nature has provided us with two methods of eye adaptation—pupil area adjustment and retinal adaptation. Neither of these methods of accommodation can function rapidly enough to be of assistance in maintaining a reasonable degree of visibility when entering an underpass. Under daytime driving conditions the pupils of the eyes are greatly contracted. The ability to see clearly is a function of the area of the pupil, and the eye with a contracted pupil is seriously handicapped when leaving a high level of illumination for a low level.

There would of course be no reduced visibility upon entering an underpass if at the underpass entrance there were artificial lighting comparable to the daylight illumination, with a gradually reducing level of artificial lighting within the underpass. While this would be prohibitively expensive, it is, fortunately, not necessary to provide artificial illumination of such a high order. The human eye can readily adapt itself to reductions of illumination of an order of at least 10 to 1 without serious loss in the ability to see. Therefore, the problem of daytime artificial lighting at the entrance, with the assistance of every other agency that will improve the visibility during this critical period of transition, is capable of satisfactory solution without excessive expense.

The first step in the solution of the daytime lighting problem is to make a daylight penetration study of the particular underpass under consideration. Although a study of this nature involves many variables, and in the end may result in only an approximate curve, the data are valuable in that they give some idea of the rapidity with which daylight falls within the underpass. Curve A, below, is a daylight curve, calculated for an underpass upon which construction



UNDERPASS LIGHTING CURVES

will begin in the near future. No work has been done specifically on the subject of daylight penetration in underpasses, but methods of predicting daylight in interiors are available which can be used with some modifications to reach approximate results.*

Having obtained the daylight penetration curve, the next step is to determine how rapidly the illumination may fall off without causing the human eye to lose its ability to see. This is shown by Curve B, an approximation which has been obtained in the laboratory with a light box so designed that the levels of illumination could be dropped in logarithmic steps at an equal rate.

In order to obtain data for the minimum visibility curve, which was plotted to the same scale as the daylight penetration curve, it was necessary to assume a rate of travel for the automobile. In this case a speed of 35 miles per hour was chosen, which is approximately 50 feet a second. Thus, it was found that the ability to see was lost if the illumination fell to less than 20 foot-candles before the first 50 feet was covered (corresponding to one second of travel at 35 miles per hour). This curve is then superimposed upon the daylight penetration curve, and the difference between the two curves, that is, the shaded area, is the daytime illumination that must be supplied by artificial lighting.

Methods of Lighting

A convenient method of lighting an underpass which requires artificial lighting by day consists in the use of a unit wired for two circuits, a day circuit and a night circuit. This unit may employ two or more lamps, circuited in such a manner that at least one of the lamps burns 24 hours a day and the remaining lamps burn during the daytime only. The daytime circuit can be controlled by a time switch with settings opposite to that of a time clock on the regular street-lighting system.

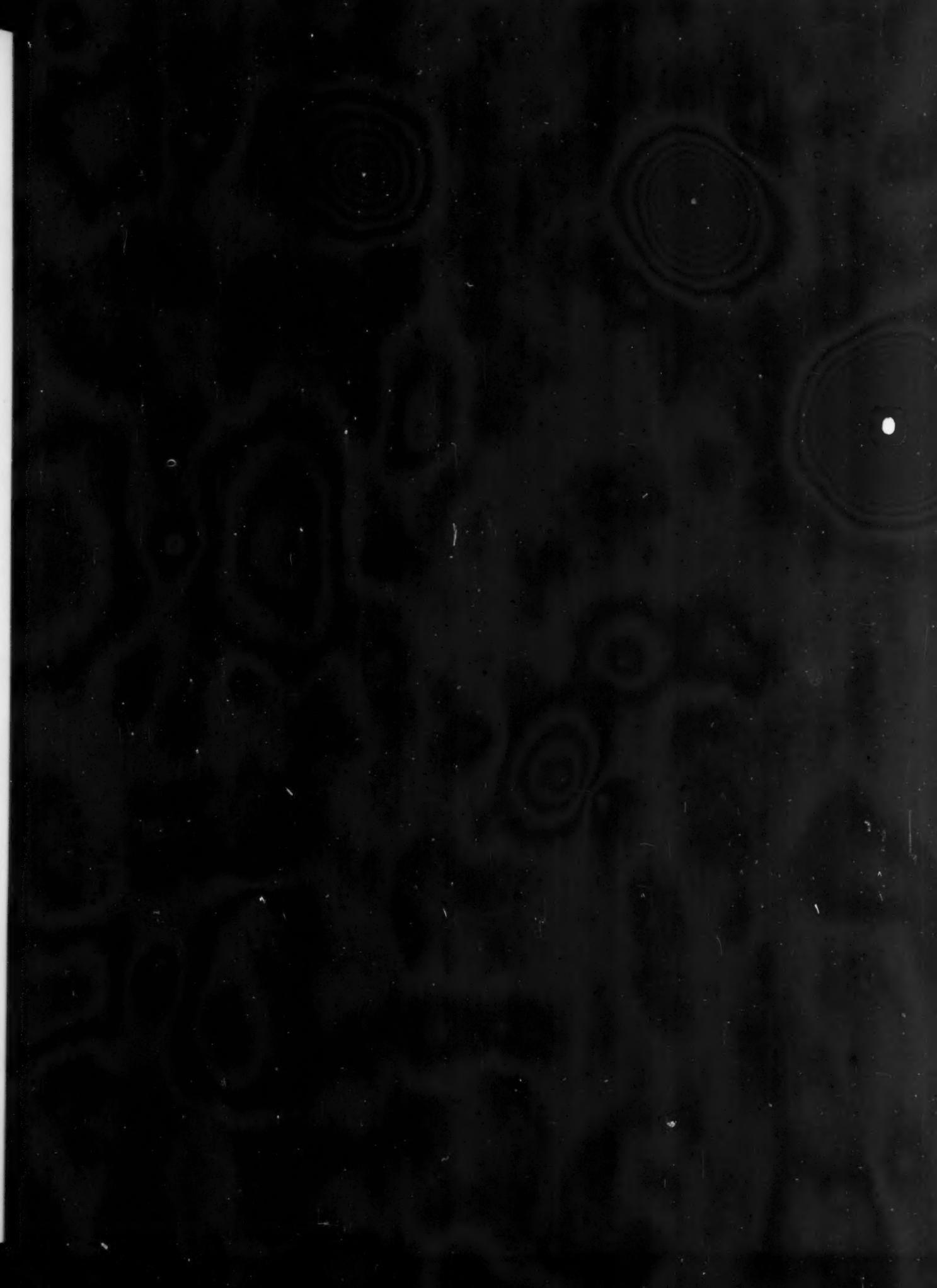
In the case of an underpass requiring only night lighting, satisfactory results can be obtained by the use of reflectors such as the RLM dome; however, better utilization of light is obtained if a large portion of the artificial light is directed against the side walls and ceiling, which can be more easily maintained at a high reflection factor.

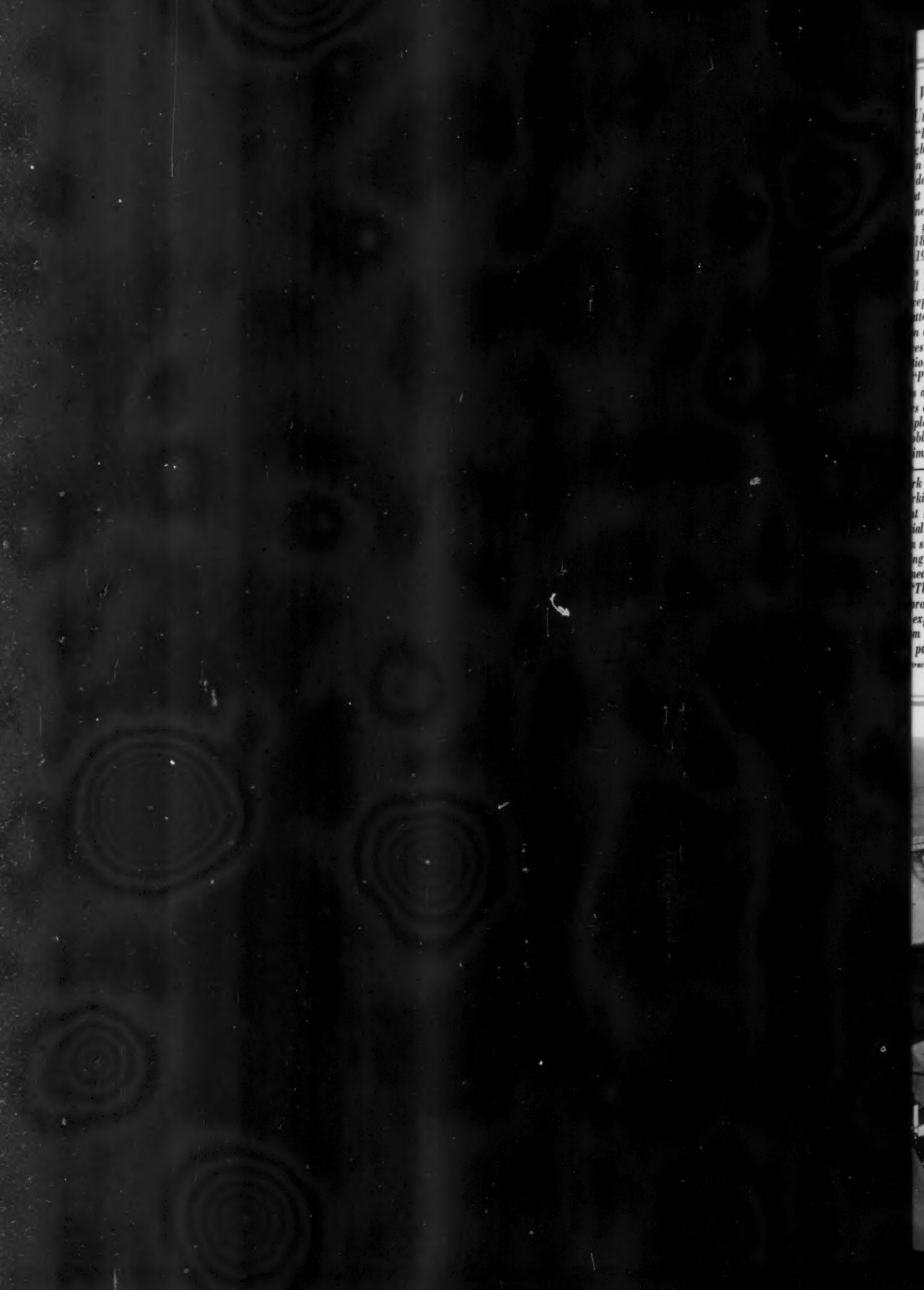
Every possible physical factor which will aid visibility within an underpass should be employed. For example, the pavement at the underpass approach should be a dark asphalt or macadam, to minimize reflections in the windshield, while light-colored concrete surfacing should be used within the underpass to obtain the greatest possible light reflection. This factor alone will greatly improve visibility during the transition period. In addition to road surfacing, such aids to visibility as white center strips, white curbs, light-colored side walls and ceilings should be incorporated.

A great deal of work is yet to be done along the lines of underpass lighting. The brief analysis given here merely serves to introduce the problem with its complexities. Accurate and complete methods of determining daylight penetration are needed, since such factors as the effect of light wells, structural columns, curves, and grades in the underpass are variables which should be taken into consideration when making the daylight prediction. A precise determination of the maximum rate at which the eye can adjust itself to decreasing values of illumination without seriously impairing visibility would be invaluable in this connection. It is hoped that this discussion will prompt both theoretical studies and experimental installations of underpass lighting.

ACKNOWLEDGMENT.—A paper presented at the convention of the American Society of Municipal Engineers, Detroit, Mich., in January, 1933.

* Prof. H. H. Higbee and W. Turner-Szymanowski, "Calculation of Daylighting," and W. C. Randall and H. J. Martin, "Predetermination of Daylighting"—both in *Transactions I.E.S.*, March, 1930.





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Vigorous Offensive for Prosperity Urged by the New Secretary of War

"Let no timid soul nor special propaganda frighten us into thinking that our national credit is in danger. Our national credit has never been in danger. Have we become so weak and puny that a deficit of five billion dollars can undermine any American's faith in the soundness of our government? Have we forgotten that in 1918 we had a deficit of nine billion dollars and in 1919 we had a deficit of thirteen billion dollars without hurting our national credit? We still have everything we had during the boom except our nerve and our faith. What's the matter with us anyway? Have we become a nation of cowards and slackers, that we pull long faces and talk lugubriously about impairing our national credit? . . . .

"Probably the most distinguishing mark of this depression has been the tremendous number of persons denied opportunity for gainful employment. The President has attacked this problem in his characteristic bold fashion. His ultimate goal is not better support of idle people—but the providing of useful and needful work in order that every individual desirous of working may have opportunity to do so. President Roosevelt has not hesitated to say that a social and economic order worthy of perpetuation should be able to provide a reasonably high living standard for the people it has been designed to serve. . . . .

"This is no time for curtailing needed public improvements. On the contrary, they should be expanded, not merely as a make-work program for unemployment relief, but to prime the pump of industrial resumption."

Excerpts from address of Honorable George H. Dern, in Boston, March 17, 1933.

In the recent California earthquake the Long Beach Municipal Auditorium, shown below, and other substantial buildings, were unscathed.

In the economic earthquake from which the nation is now recovering, the cities of the United States are emerging, substantially unscathed, for an era of sounder and finer development than they have ever known. To hasten this era is the task of municipal and national statesmanship.